Refrigeration

IN THIS ISSUE

PRE-COOLING FRUITS

A premium fruit is produced when chilled before being loaded in refrigerator cars.

ICE PRICES FOR 1950

Ice prices for 1950 are tabulated and analyzed—An annual feature of ICE AND REFRIGERATION for more than 30 years.

AIR PURIFICATION IN APPLE HOUSES

Activated carbon as used in apple storage houses in the east are visited by leading research men.

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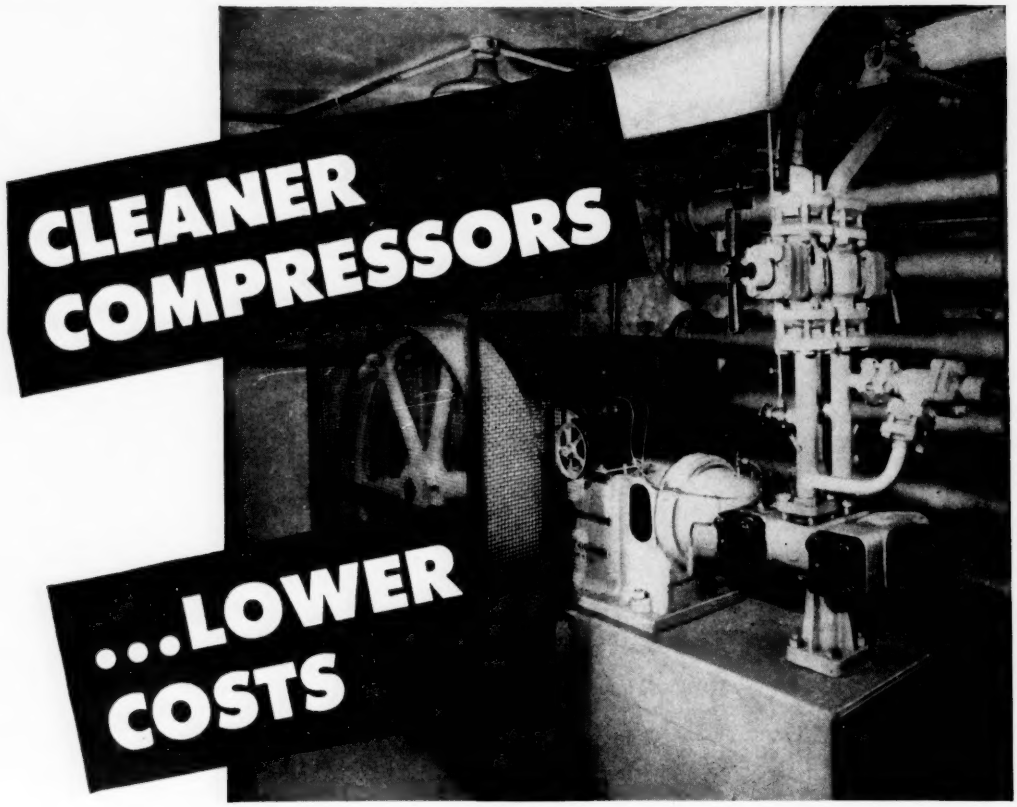


When you lubricate with Texaco Capella Oils

Get all the refrigeration tonnage your compressors were designed to deliver and reduce your maintenance costs at the same time. The experience of operators everywhere proves you can do it with *Texaco Capella Oils.*

Texaco Capella Oils are highly refined for extreme stability and resistance to oxidation, gum and sludge formations. They are moisture-free . . . do not react with refrigerants. Pour tests are very low.

Whatever the size or type of your compressors, there are *Texaco Capella Oils* of suitable viscosity to assure clean, efficient, trouble-free operation with minimum maintenance costs. Let a Texaco Lubrication Engineer help you make the proper selection.

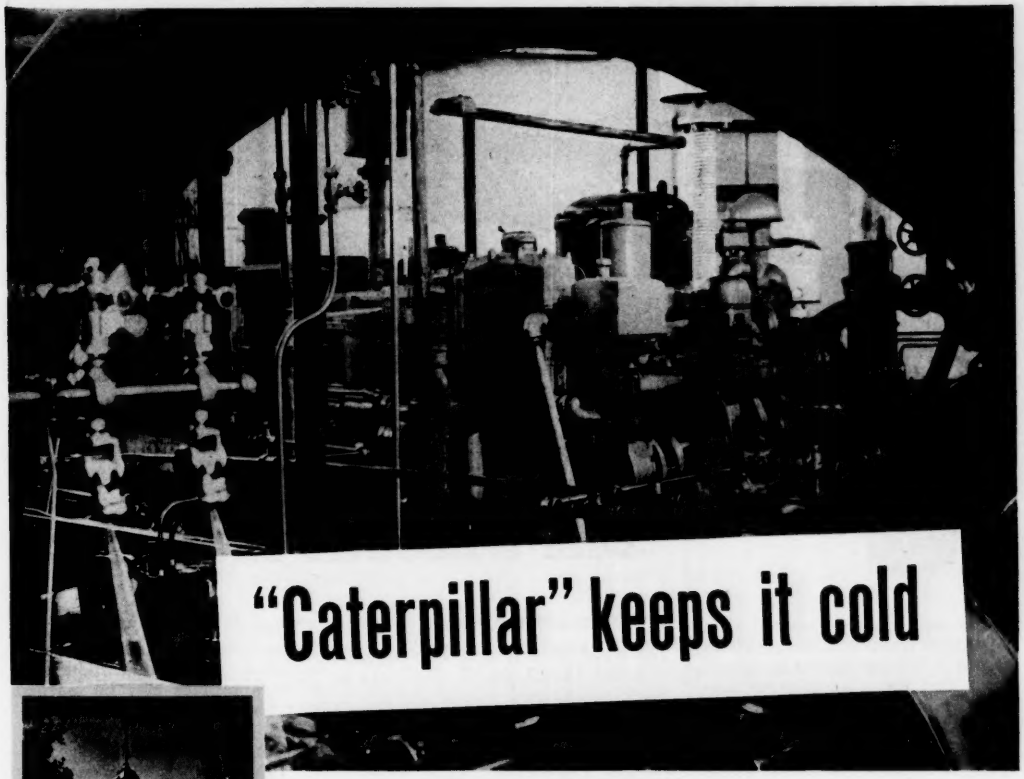
Just call the nearest of the more than 2,000 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO Capella Oils

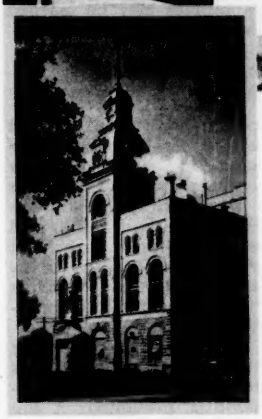
FOR ALL AIR CONDITIONING AND REFRIGERATING EQUIPMENT

TEXACO

TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE on television every Tuesday night. See newspaper for time and station.



"Caterpillar" keeps it cold



Three "Cat" Diesel D8800 Engines power the refrigerating system at the Fox Head brew house, Waukesha, Wis.

In the big, modern brew house of Fox Head Brewing Co., at Waukesha, Wisconsin, a team of three "Caterpillar" Diesel Engines handle a big refrigerating job.

Each engine powers a 50-ton Frick ammonia compressor. Together they cool 720 barrels of beer a day, working to the exacting temperatures required for a fine brew.

Says J. Q. Knight, Chief Engineer: "I got onto the job of operating these 'Cat' Engines in 15 minutes. They're so simple and dependable all we have to do is start 'em and stop 'em as power demands change. They're flexible, too – deliver full power for peak cooling requirements, or throttle down for light loads."

Your "Caterpillar" dealer has the right size engine for *your* ice-making or refrigeration job – and the parts and service facilities to keep it working profitably long after it's paid for itself. Ask him for a demonstration, or send the coupon today.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

LOOK UNDER THE HIDE

Lubricating oils break down at high operating temperatures, forming carbons and gums—enemies of long engine life. To prevent lube oil breakdown, "Caterpillar" Engines are equipped with oil coolers. Pistons are oil sprayed to remove heat. Controlled oil temperature preserves lubricating qualities—reduces maintenance costs—adds to owner profits. *Look under the hide for quality.*

CATERPILLAR DIESEL

REG. U. S. PAT. OFF.

ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

CATERPILLAR TRACTOR CO.
Box IR-5, Peoria, Illinois

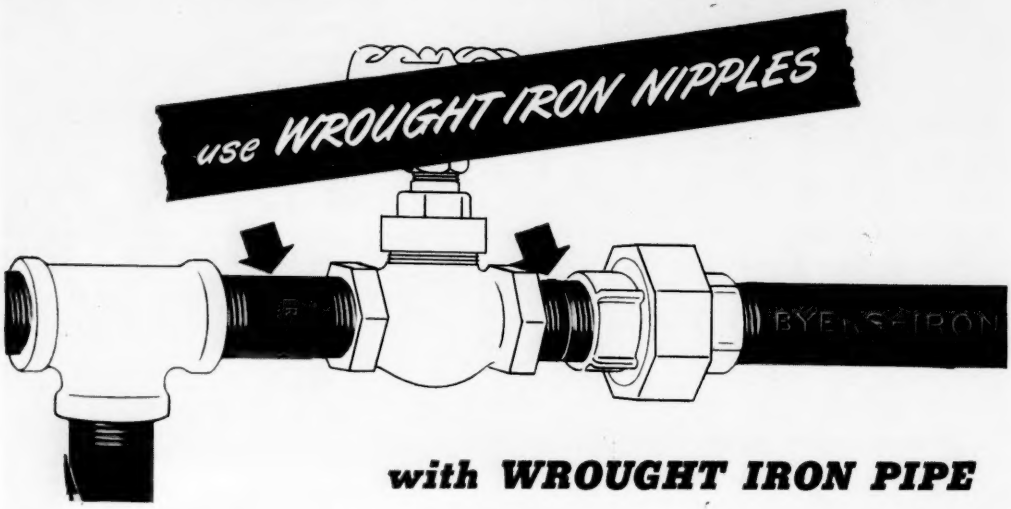
Please send me your latest booklet, "Refrigeration Assured."

NAME _____

ADDRESS _____

CITY _____ STATE _____

Avoid "Weak Links" in your piping systems—



with WROUGHT IRON PIPE

When you specify wrought iron pipe to lick some corrosion problem, assure 100% protection by specifying that the pipe nipples also must be wrought iron. Neglect of this simple precaution will leave weak spots in your lines, and set the stage for maintenance headaches.

METHOD OF SPECIFICATION

Merely stating that the piping "system" is to be black or galvanized wrought iron is not enough; the use of wrought iron nipples should be specifically designated. This may be done by requiring that the wrought iron nipples shall be made of pipe conforming to the requirements of A.S.T.M. Specification A72-45, Federal Specification WW-P-441a, Navy Specification 44P11k, or any accredited proprietary specification.

WIDE RANGE OF SIZES

Byers Wrought Iron nipples, both standard weight and extra strong, are available in a wide range of sizes and lengths, either black or galvanized. They are manufactured from new, tested, full-weight wrought iron pipe in accordance with the standards established in the specifications of leading technical organizations. All nipples are furnished with right-hand threads unless otherwise specified; nipples with right and left-hand threads are also available. Nipples are furnished "close" or to length as specified.

IDENTIFICATION

The word "Byers" and the weight —either "Std." or "X Stg." are machine stamped around the circumference of Byers Wrought Iron nipples. On close nipples, where it is impractical to stamp on the threads, a red band is used. These markings provide quick, positive identification of Byers Wrought Iron nipples, and help to avoid any danger of accidental substitution of non-durable nipples in the line.

IN WELDED SYSTEMS USE WROUGHT IRON WELDING FITTINGS

Wrought iron welding fittings are available in a wide range of types and sizes from leading fitting manufacturers. Just contact your supplier.

Wrought iron nipples are also available from a number of manufacturers. The identification used on such nipples may be learned by consulting the supplier.

INHERENT CORROSION RESISTANCE

The superior resistance of wrought iron nipples comes from the unique composition and structure of the material. Tiny threads of glass-like silicate slag, distributed through the body of high-purity iron, halt and "detour" corrosive attack, and so discourage pitting. The fibers also anchor the initial protective scale, which shields the underlying metal.

The best guide in applying wrought iron is a knowledge of its character and properties. The complete story is presented in the booklet, "The ABC's of Wrought Iron". Ask for a copy.

A. M. Byers Co., Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, Salt Lake City, Seattle, San Francisco. Export Division: New York, N.Y.

CORROSION COSTS YOU MORE THAN WROUGHT IRON

BYERS
GENUINE WROUGHT IRON
TUBULAR AND HOT ROLLED PRODUCTS
ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

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The *DEMAND* Is for QUALITY ICE

For Ice That Will Not Produce Slime In Ice Boxes...

Use DISTILEX This Way...

Dispense with Soda Ash, Sodium Aluminate, Alum and Similar Products . . . and

SIMPLY MIX DISTILEX WITH THE LIME YOU ARE NOW USING!

Block on left treated with Distilex, only one core emptied. Right, untreated water, cores were emptied twice. Most Distilex users do not empty cores at all.

***RESULT** . . . .* High-grade Crystal Ice from raw water . . . Ice free from slime and deposits . . . Ice without color, odor, taste . . . Ice which can be produced at very low temperature* with no cracking while being frozen, dumped or cut.

*DISTILEX treated water can make Ice in LESS THAN 25 HOURS at 10° brine temperature!

Test DISTILEX in your plant. If not entirely satisfied, purchase price will be refunded on all DISTILEX returned. $25.00 per 100 lbs., f.o.b. Birmingham.

Use SOLVEX for COMPRESSOR COOLING SYSTEMS

HIGH HEAD PRESSURES QUICKLY LOWERED with this remarkable chemical. SOLVEX can be quickly applied without breaking a joint. REMOVES RUST, SCALE, ALGAE, OIL AND ENCRUSTING MATTER from condenser tubes and water jackets in one to five days operation. Ideal for cleaning scale and corrosion from boilers, heaters and tanks.

An effective conditioner for spray ponds and cooling towers. SOLVEX goes to work immediately WITHOUT COSTLY SHUTDOWNS. Cooling efficiency is rapidly restored by using one pound per 10 gallons of water.

Write NOW for Further Particulars on These MONEY-SAVING AIDS TO BETTER ICE MAKING!

The CSCO STABLEIZER MAINTAINS GOOD BRINE by a positive reaction to either OVER-ACIDITY or OVER-ALKALINITY!

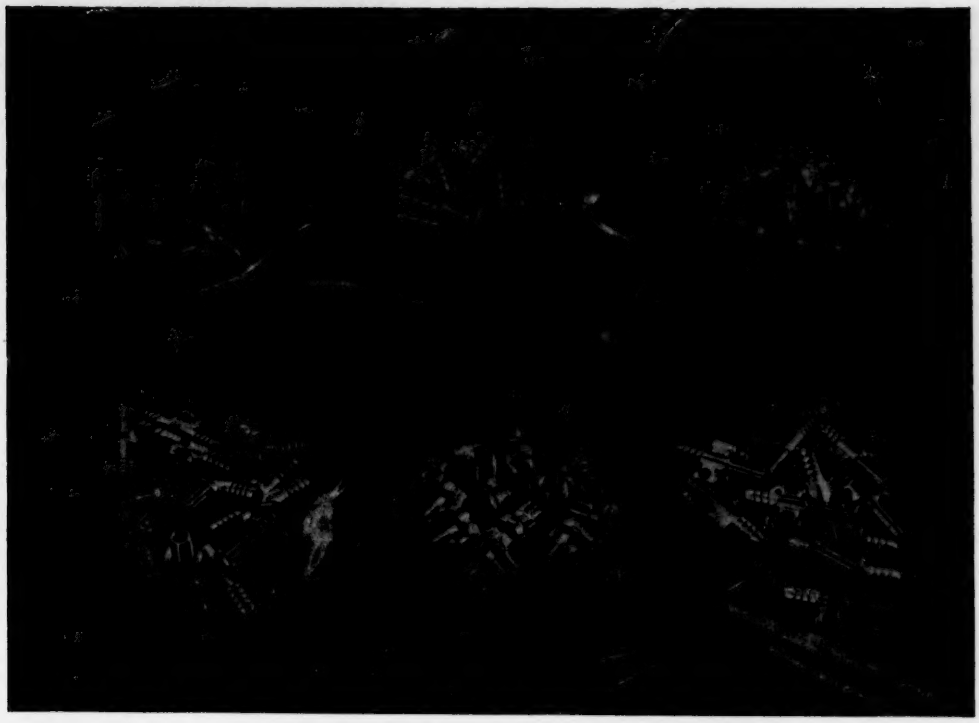
A scientific combination of pure metals upon which damaging materials in brine will "feed" in preference to the brine tank or ice cans, thereby SAVING them!

the CSCO STABLEIZER removes destructive material from the brine without adding harmful chemicals. Easily installed in all systems. No other brine treatment compares in SAFETY! The STABLEIZER does not make brine harmful to workmen's hands. PROTECTS AND PRESERVES EXPENSIVE EQUIPMENT!

CHEMICAL SOLVENT COMPANY

3005—16th Street North — Birmingham, Ala.

Martocello QUALITY



OUR PRODUCTS ARE MANUFACTURED FROM THE FINEST MATERIALS AND DESIGNED TO GIVE LONGER AND MORE EFFICIENT OPERATION

compare their **QUALITY** *and* **WORKMANSHIP** *with all others and satisfy yourself that they are the very best*

COMPLETE AIR AGITATION SYSTEMS AND ICE PLANTS

"HELPFUL SUGGESTIONS"

Our Self-Centering Drop Tubes are free to swing both lengthwise and crosswise the core cavity, and are more desirable than Drop Tubes that swing in one restricted direction only.

It is essential for a Drop Tube to swing the long way of the core cavity so as to wash or keep foreign matters in suspension, and to prevent white "fish tails" (or "feathers") from occuring in the ice back. It is also essential for a Drop Tube to be free to self-center even in the cases when they are carelessly bent out of shape. Drop Tubes should be properly perforated, of proper temper, size and weight to assure users of satisfactory operation and best results. Our Perforated Self-Centering "Freeze-In" Drop Tubes embody all these vital and important features. In addition, our Self-Centering Brackets, both Offset or Straight Form of either the Standard or Duplex Styles, comprise all the necessary valuable characteristics that are not matched in the slightest conceivable way by other makes.

REPRESENTED ON THE WEST COAST BY WESTERN ICE EQUIPMENT CO., 420 MARKET ST., SAN FRANCISCO, CALIF.

JOS. A. MARTOCELLO & CO.

229-231 North 13th Street **Philadelphia, 7, Pa.**

ROCKY MOUNT, N. C., HAS MODEL "AUTOMATIC" ICE PLANT

Rocky Mount is one of the fastest growing towns in eastern North Carolina. It is on both U. S. Highway 301 and the Atlantic Coast Line R.R., which carry much of the Florida traffic.

Here the Tar River Ice Company has built a new plant of 30 to 33 tons capacity. The building measures 65 by 85 feet, and has a large apron for parking. The construction is very substantial and attractive.

The brine tank has 400 Frick-Knickerbocker ALL-WELDED ice cans, which are handled four at a time by grids. The three 6 by 6 compressors discharge into evaporative condensers.

Automatic control equipment is installed to save hand labor wherever practicable, the compressors being started and stopped by thermostats in the brine tank. The ice is pulled in either one or two shifts, as occasion demands. Considerable trade is expected in the icing of trucks. The ice is scored or crushed and packaged, as desired. The storage capacity is ample for holding 60 tons.

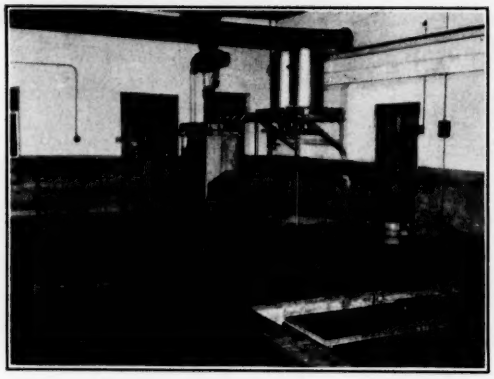
Another example of a new ice plant, Frick-designed and Frick-equipped, that is a model of its kind. Let us quote now on the refrigerating and ice-making machinery you need.

DEPENDABLE REFRIGERATION SINCE 1882

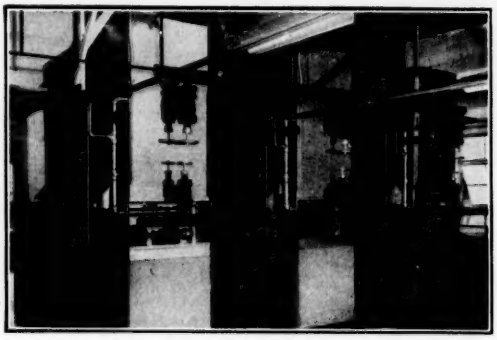
FRICK CO.

WAYNESBORO, PENNA. U.S.A.

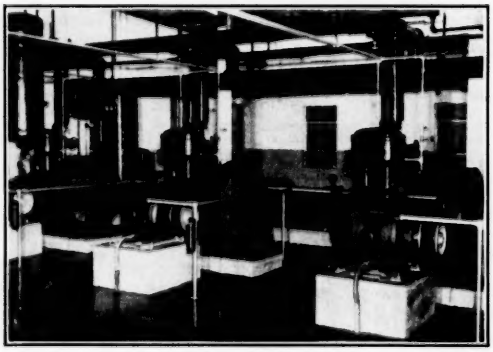
Also Builders of Power Farming and Sawmill Machinery.



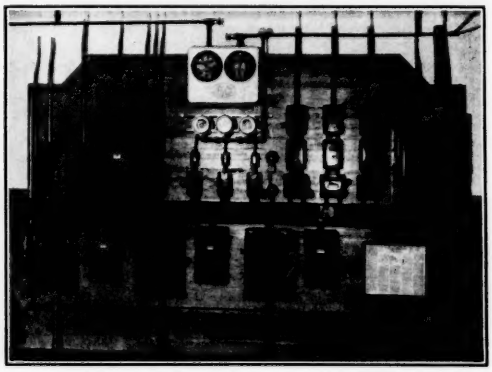
Four ALL-WELDED Ice Cans are Harvested at a Time, Using Frick Grids.



These Evaporative Condensers Keep Head Pressures Within Reason, and Save Water.



Three 6 by 6 Compressors under Automatic Control Make 30-33 Tons of Ice Daily.



The Switchboard at Tar River Ice Co. is Unusually Complete.

"On sanitation we take no chances- we insist on Packaged Processed Ice"

SAYS LOUIS G. PALMER, OWNER, YE OLDE WAYNE CLUB, DETROIT, MICH.

A view of the Mad Anthony Room of Ye Olde Wayne Club, a smart dining place of Detroit, Mich.

Watch Processed Ice Sales Go Up When You Switch to Paper Bags!

SALES always go UP when you switch to Union one-trip paper ice bags for processed ice! That's because icing with these handy bags is so easy that customers use more ice. And the cleanliness of ice delivered in old-fashioned open-top containers is insured by the tightly closed top of the Union bag, which keeps out dirt and prevents spilling or pilferage.

Yes, the Union one-trip ice bags cut your costs, too. The sturdy wet-strength paper — two layers thick — definitely retards melting. Eliminating re-handling of old-style containers speeds up operations at the loading dock, saves drivers' time.

You win on sales and you win on lower costs when you switch to Union one-trip paper ice bags. Write for samples.

Wet-Strength Paper Ice Bags have tremendous strength even when soaking wet... thanks to a water repellent resin that binds the fibres of the paper firmly together.

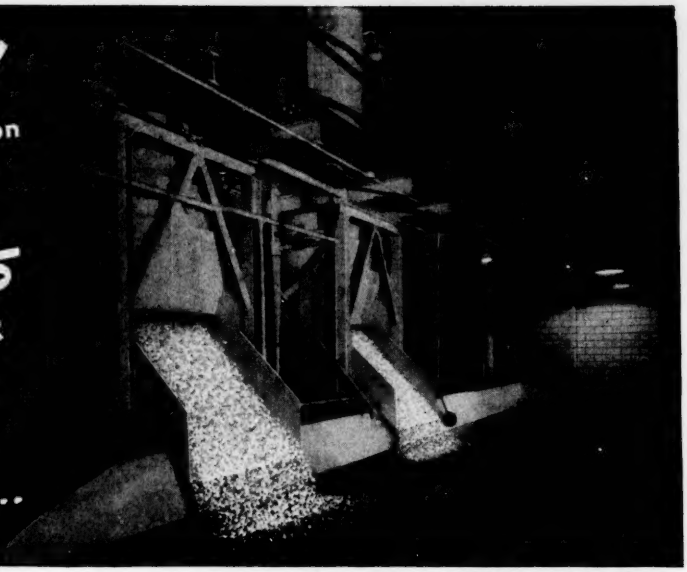
ONE TRIP

UNION Paper Ice Bags

A product of the UNION BAG & PAPER CORPORATION • Woolworth Bldg., New York 7, N. Y.

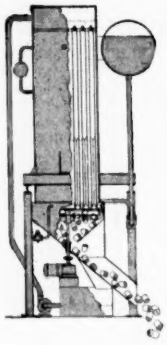
Bags of Kraft, Transparent Films Waxed Paper Glassine, Laminates

120 TON
connected refrigeration capacity provides equivalent of
300 TONS
COLD WATER
refrigeration for Wort Cooling
with the...



Tube-Ice Machines and Latent Heat Water Tank at Burkhardt Brewing Co., Akron, Ohio.

Vogt Automatic TUBE-ICE MACHINE



HOW THE TUBE-ICE MACHINE FUNCTIONS

In making ice, water is pumped to the top of the freezer and flows downward along the inside walls of tubes into a water tank. Refrigerant in shell surrounds tubes and freezes water into cylinders of ice. An automatic timing mechanism operates suitable valves to control all functions of the machine. Ice is freed from the tubes by thawing when the refrigerant is displaced by high pressure warm gas from the compressor.

To cool water only the evaporating pressure is raised above that required for making ice.

Employing direct application of the refrigerant, all expense incidental to other systems is eliminated.

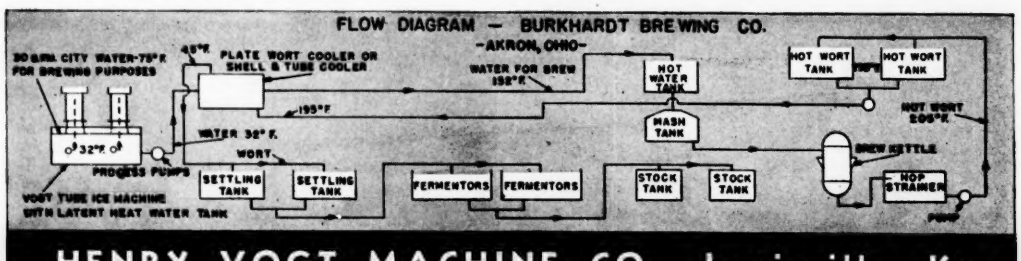
Patent Numbers 2,200,424, 2,239,234, 2,396,308. Other Patents Pend.

The Burkhardt Brewing Co., Akron, Ohio, saves more than 50% of their cold water refrigeration cost with a modern Vogt Water Cooling System!

Here, two Vogt Automatic Tube-Ice Machines make cold water during the day and Vogtice at night, thus utilizing refrigerating capacity around-the-clock. The stored ice acts as a flywheel by cooling make-up water to augment the supply made by the machine to meet the peak wort cooling loads. The refrigeration load demand is thereby leveled out with a resulting reduction in demand charges on electrical energy, and the use factor of installed equipment approaches 100%.

Additional economy is realized from this system since the water, after cooling the wort, goes into the next batch of beer. Thus no heat potential is wasted but all is used to do useful work.

A flow diagram of the Burkhardt Brewery is shown below.

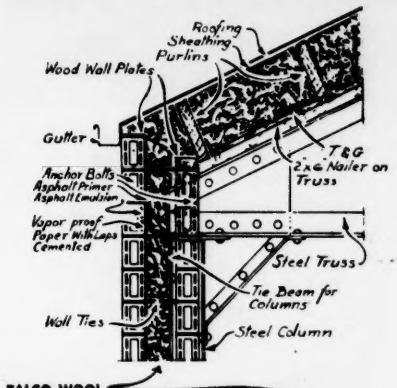


HENRY VOGT MACHINE CO., Louisville, Ky.

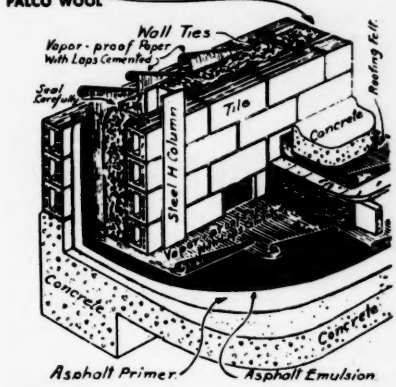
BRANCH OFFICES: NEW YORK PHILADELPHIA CLEVELAND CHICAGO ST. LOUIS DALLAS

INSTALLATION FILE NO. 1005

How to get maximum efficiency with PALCO INSULATION WOOL



PALCO WOOL



Recommended **FOR COLD STORAGE, DOUBLE TILE WALL CONSTRUCTION**—Drawings show desirable method of joining floor, wall and roof insulation. Steel "H" columns to support roof trusses are placed at inner curtain wall. Metal wall ties provide lateral support for outer tile wall. Inside face of outer wall should be thoroughly brushed, cleaned, then vapor-proofed with asphalt primer, asphalt emulsion, and vapor-proof paper with 4-inch laps cemented with asphalt emulsion. Vapor-proof paper should be carefully sealed at each wall tie with asphalt emulsion. Note how alternate tile is omitted in bottom course of wall below floor line. PALCO WOOL INSULATION is installed as laying of tile progresses.

Applied **FRED FUNK & SON COLD STORAGE BUILDING, BANGOR, MICHIGAN**—Illustrates proper installation methods. High efficiency (thermal conductivity of only .255 B.t.u.) of flame-proofed PALCO WOOL assures minimum operating cost. It's the ideal insulation for all food storage --odorless, odor proof, moisture resistant. Resilient fibers stay in place, won't deteriorate. Take a tip from leading cold storage experts--insist on PALCO WOOL INSULATION.

NATURE'S INSULATION · WOOD · BARK · REDWOOD · AGE-OLD · FLAMEPROOFED

Mail attached coupon today for more detailed information.

THE PACIFIC LUMBER COMPANY
100 BUSH STREET, SAN FRANCISCO 4, CALIFORNIA
5225 WILSHIRE BLVD., LOS ANGELES 36, CALIFORNIA
35 EAST WACKER DRIVE, CHICAGO 1, ILLINOIS

THE PACIFIC LUMBER COMPANY
100 BUSH STREET
SAN FRANCISCO 4, CALIFORNIA

Please send me without obligation:

- ☐ PALCO WOOL COLD STORAGE MANUAL
- ☐ LOCKER PLANT PLAN AND CONSTRUCTION MANUAL

Name_____
Title_____
Company_____
Street_____
City_____ Zone____ State_____

003-12

Extra Ice Sales . . . Extra Profits

Automatically Yours!

with POLAR ICE VENDING EQUIPMENT*

- **COMPLETE STATIONS WITH VENDORS**
- **VENDORS FOR YOUR PRESENT STORAGE ROOM**

Polar Vendors and Stations are silent salesmen that are on duty day and night making cash sales for you! Your customers will appreciate the fact that they can serve themselves in ten seconds from conveniently located Polar units which provide automatic ice service 24 hours a day, every day of the year.

Besides collecting for every nickel's worth of ice you sell, Polar equipment will also keep a permanent record of sales made for each vendor is equipped with an automatic counter.

Polar Ice Stations are sturdily built of heavy gauge aluminum and insulated with 6½" of high density Fiberglas, completely vaporsealed. Surplus power refrigeration units further insure economical operation, and zero temperatures are guaranteed at 95° temperature difference.

You can depend on Polar Equipment to boost your sales and profits. We invite you to investigate now the profit possibilities of merchandising ice the Polar way. With Polar equipment you'll increase your volume of business and at the same time LOWER YOUR DISTRIBUTION COSTS!

***Selected by the planning board for installation in the model village at Oak Ridge, Tennessee.**

INSTALL POLAR EQUIPMENT—NOW! SATISFACTION GUARANTEED

WRITE TODAY FOR COMPLETE INFORMATION

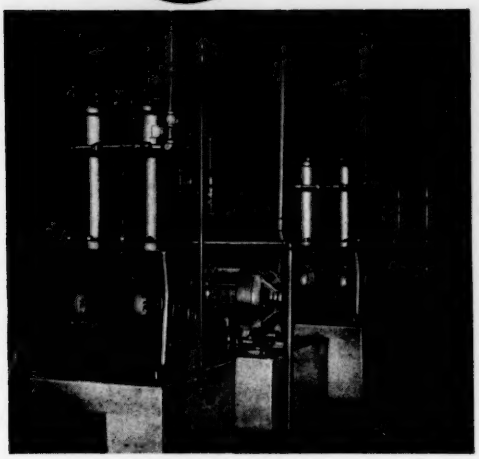
REFRIGERATION ENGINEERING COMPANY

211 Foshay Tower, • Minneapolis 2, Minnesota

HERE'S HOWE

SHELL AND TUBE CONDENSERS • Install Now!

(REMOVABLE TUBE DESIGN)



Three 20-ton Howe Compressors

YOU SAVE money, space, labor, time, with Howe individually engineered installations, large or small. You get that constant exact temperature and humidity control which in thousands of plants is keeping products at top quality. Howe Shell and Tube Condensers can be compactly grouped in batteries for multiple installations, for any capacity plant. Both shell and tube and shell and coil types for Freon.

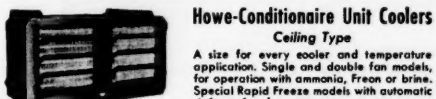
OUTSTANDING FEATURES • RETUBING — without special tools • RETUBING — without experienced mechanics • TUBES — standard material purchasable in any locality.

HOWE EVAPORATIVE CONDENSERS save 95% on water, as well as space. Ideal for restricted water areas.

GET THE BENEFITS of Howe's 38 years of practical, test-proved refrigeration knowledge and their ruggedly built, trouble-free equipment. Write for free booklet, or without obligation consult Howe engineers on your specific problems.

SINCE 1912, BUILDERS *exclusively of refrigeration equipment: Ammonia compressors, standard, multiple effect and boosters, 2 to 150 tons; self-contained automatic ammonia units; Freon condensing units; shell and tube condensers; brine and water coolers; unit coolers; fin coils; locker freezing units; air conditioning (cooling) equipment.*

A few territories still open . . . write for details about the HOWE profit-plan for new distributors.



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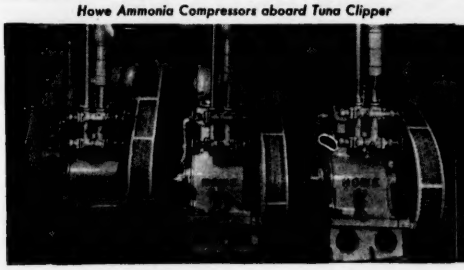
Ceiling Type

A size for every cooler and temperature application. Single and double fan models, for operation with ammonia, Freon or brine. Special Rapid Freeze models with automatic defrost for low temperature storage or processing.

Howe Ammonia Compressors aboard Tuna Clipper



HOWE

"BUTCHER BOY" is the preferred cold storage door of the industry, because it has ALWAYS met every conceivable challenge of hard usage. The strong, massive construction of Butcher Boy doors is the result of "controlled quality" production — a guarantee that they will meet every rigid test of required performance.

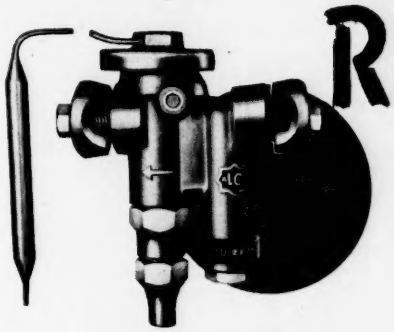
Time tested heavy duty hardware applications, PLUS prime insulation, PLUS 100% Douglas Fir Construction is a resultant product equalled by none — BUTCHER BOY. Write for free bulletins today.

VESTIBULE-TYPE TRACK DOOR

BUTCHER BOY COLD STORAGE DOOR CO.

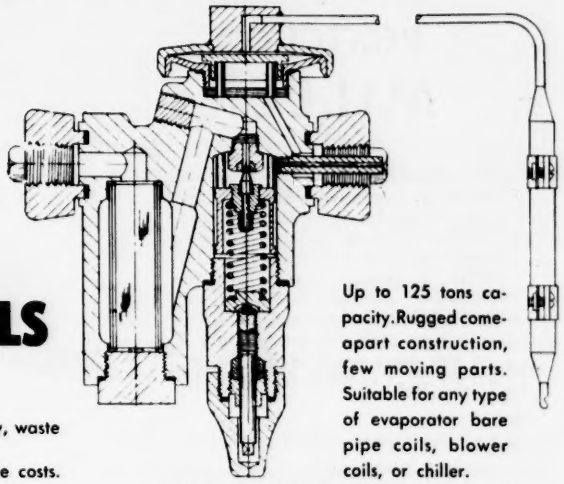
170 N. SANGAMON ST., CHICAGO 7, U. S. A.

AMMONIA EFFICIENCY *begins* RIGHT HERE



with sturdy (yet sensitive)

ALCO CONTROLS



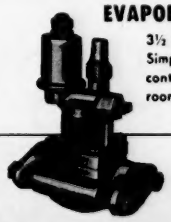
Up to 125 tons capacity. Rugged come-apart construction, few moving parts. Suitable for any type of evaporator bare pipe coils, blower coils, or chiller.

THERMO EXPANSION VALVES

Sluggish, outmoded valves cut down freezing capacity, waste your profits through high operating and maintenance costs. Save this waste — replace *now* with accurate, ALCO Controls, ruggedly built to maintain peak efficiency for years.

SOLENOID VALVES

Liquid: 10 to 172 tons; Suction: 2.7 to 28 tons. Flanged semi-steel bodies. Heavy duty coils designed for continuous operation. For use wherever positive stop service is required.



EVAPORATOR PRESSURE REGULATORS

3½ to 200 tons. Pilot operated for high sensitivity. Simple cage construction. Designed to give close control of evaporator pressures in cold storage rooms, chill rooms, water chillers, etc.

A QUARTER-CENTURY OF PIONEERING AND PROGRESS

SEE YOUR ALCO WHOLESALER

ALCO VALVE CO.

835 KINGSLAND AVE. • ST. LOUIS 5, MO.

Designers and Manufacturers of Thermostatic Expansion Valves; Evaporator Pressure Regulators; Solenoid Valves, Float Valves; Float Switches.

ALCO HAS REFRIGERATION UNDER CONTROL 4276

Ready TO SERVE YOU NOW...

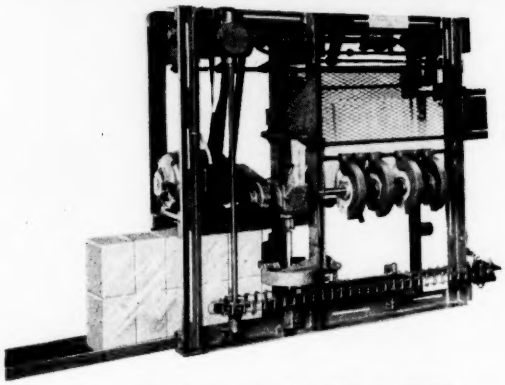
THE 1950 ICE SEASON IS HERE!

PERFECTION MILLER

The Perfection Miller receives the ice block lengthwise on edge. It is first elevated and scored crosswise, then is conveyed through the saws which score it lengthwise. ONLY ONE operation is necessary for complete scoring. Block is put through the machine only once.

Capacity: 6 blocks per minute.

Floor space required: for 300 lb., 31" by 72". For 400 lb. 31" by 85½".



You always get that "CLEAN, EVEN-SCORE" with the Perfection-made Miller Machine.

THE MILLER ICE SCORING MACHINE IS THE LOWEST PRICED, COMPLETELY AUTOMATIC, HEAVY-DUTY SCORING MACHINE ON THE MARKET TODAY! HUNDREDS OF MILLER MACHINES ARE IN USE ALL OVER THE COUNTRY, AND HAVE BEEN FOR MANY YEARS.

Write Today For NEW LOW PRICES *on Miller Machines*

Perfection—Built Right, Priced Right for every plant large or small.

Perfection

Repair parts on all current Perfection ice scoring machines are available for immediate shipment

PERFECTION ICE SCORING MACHINE CO.
P.O. Box 2140 Fort Worth 1, Texas

In the Spotlight

EQUIPMENT to produce "chip-ice" in the form of small hollow tubes has been designed by a Swiss concern in Zurich, Switzerland. The large surfaces, it is claimed, provide an intensive cooling effect. See story on page 19.

STUDIES MADE by the United States Department of Agriculture show that when their interior quality is the same, eggs removed from cold storage and those that have not been in cold storage lose quality at about the same rate.

EVAPORATOR PRESSURE regulations are widely applied on refrigerating equipment to hold refrigerant pressure and temperature at or above the set point. On a chilling application this does not result in maximum rate of cooling. The article on page 17 by Bethell and Challman describes control of evaporator pressure from the room temperature by electro-pneumatic means so that cooling is speeded but low temperature damage is prevented.

TWO OF THE President's reorganization plans are denounced as a scheme to destroy the independent status of the administrator of the Wage and Hour Division. Details on page 29.

MANY MILLIONS of dollars worth of produce which leaves the farm in good condition ends up in the garbage cans of retail stores—because it has not been properly refrigerated.

MIDDLE western iceman reports that his experience has shown that bottled milk or other bottled drinks will sell many times better from a container with ice and cold water than from a dry cold container. It looks appetizing and the customers know that it is cold.

HYDROFREEZING promises new advances in the technique of food freezing. Studies of this process have been made at the Western Regional Research Laboratory at Albany, Calif. and on basis of the results obtained it is believed that several kinds of fruits and vegetables can be made to yield products of excellent quality. Results are discussed in article on page 60.

THE DUTIES and responsibilities of the refrigeration engineer of an industrial plant from the viewpoint of management are outlined and discussed in the article on page 39.

THIS MONTH'S COVER—A picture of fresh fruits and vegetables with their flavor and appearance preserved with crushed ice. This makes them more appetizing to consumers and cuts down waste.

GREEN VEGETABLES, such as green beans, peppers, etc., can best be preserved with ice, according to results of research conducted by the United States Department of Agriculture.

A MIDDLE-WEST ice company put on a sales contest for its employees last year and sold 1136 pieces of ice-using equipment. This year, with another similar contest they plan to sell a minimum of 1500. For details of the contest, see story on page 32.

THE MONTHLY REPORT on cold storage holdings for April 1 shows six points below average for cooler space but six points higher than a year ago; and an occupancy of seventy percent for freezer space.

VEGETABLE GROWERS in the vicinity of Minneapolis, recognizing the value of ice for cooling freshly harvested vegetables, have organized the Minnesota Hydro-Coolers Association. Story on page 35.

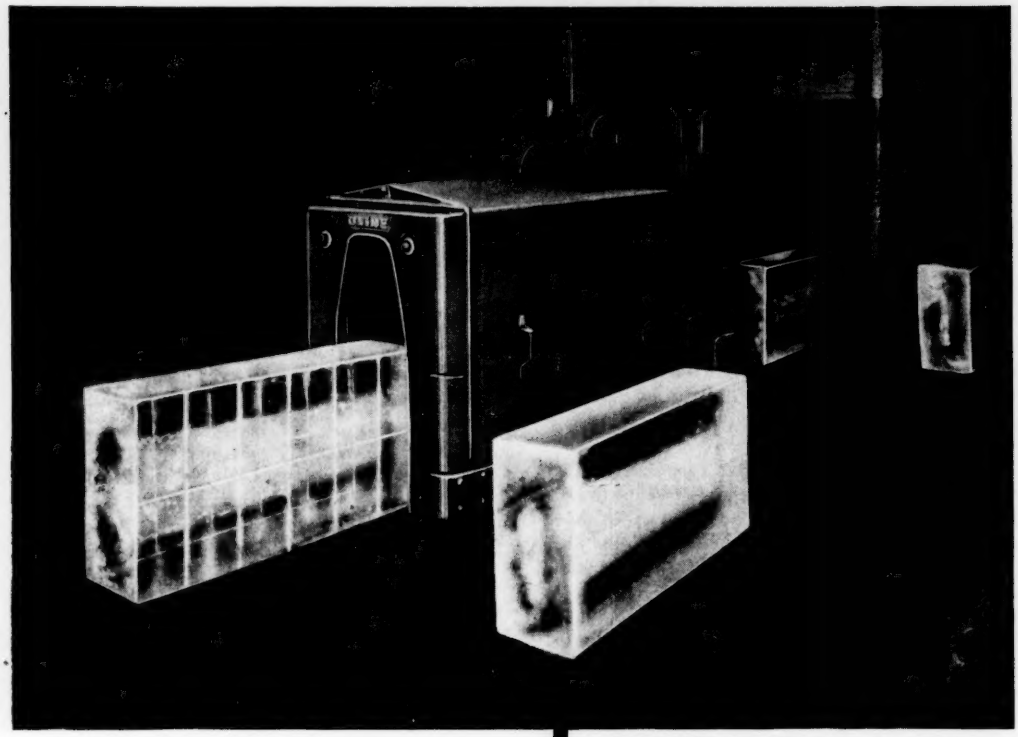
TRADE PRACTICE rules for the refrigerated warehousing industry, covering unfair trade practices and recommended trade practices, were reviewed and approved at a recent meeting in Chicago. See story on page 53.

APPROXIMATELY nine million pounds of frozen dressed young turkeys will be sold by The Commodity Credit Corporation for export only. For announcement see page 52.

COIN OPERATED refrigerated milk vending machines are being installed in selected sections of New York City. If successful they are expected to make drastic changes in fresh milk deliveries.

Ice Survives Fire

A 10-pound block of ice survived a fire that destroyed a frame house at Greenville, S. C., according to a press report. The sides of an old wooden ice refrigerator burned off and dropped to the ground leaving the ice, melting but still intact.



HANDLING COSTS

CAN BE CUT 3 WAYS

...with a G-W UM scoring machine

Investigate this completely automatic scorer-conveyor and see the big savings it can make in your plant. It is less than six feet long and barely three feet wide and can handle six 300 or 400 lb. cakes per minute. Its ruggedness is proved again and again by the many UM scorers still giving perfect service after 25 years of continuous use. Truly the greatest value ever offered in scoring machines. Write your nearest Gifford-Wood office for complete details.

1 By taking advantage *now* of a low initial cost!

Here is the greatest value ever offered in a quality scoring machine, built with the finest materials by craftsmen with years of experience in the ice industry.

2 By conveying and scoring at the same time!

As ice is moved from storage to platform through the UM Scorer-conveyor, the lengthwise and crosscut scoring operation takes place. That means big savings in labor costs, fast delivery at platform.

3 By using the UM scorer as a conveyor only!

When platform delivery of unscored ice is desired, simply press a lever, crosscut saws are disengaged. The scorer then functions as a conveyor. This two-in-one unit saves cost of installing and operating two separate machines.

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Hudson, New York

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CHICAGO 6, ILL. 565 W. WASHINGTON ST.
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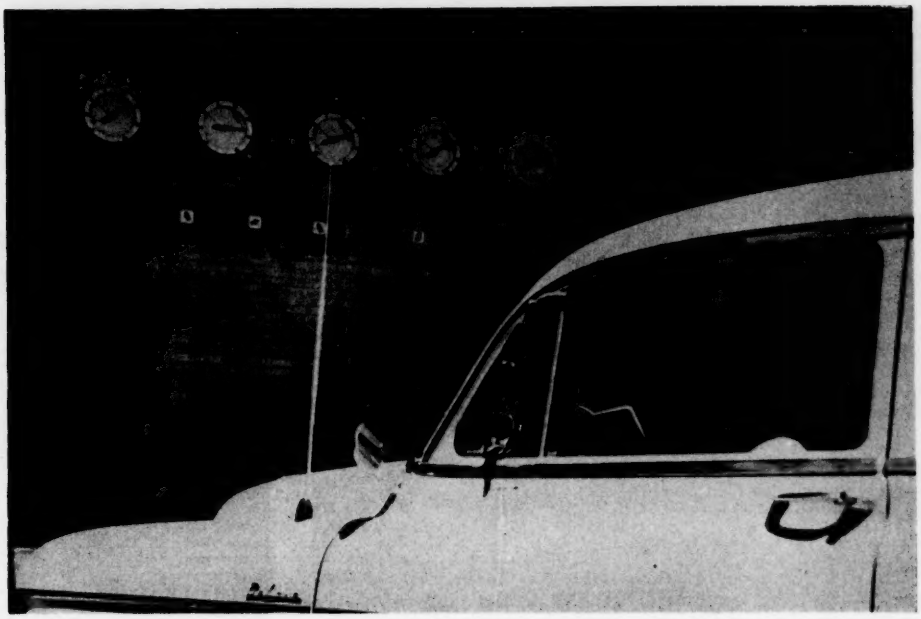
When You Think of Materials Handling – Think of GIFFORD WOOD



George Beck, refrigeration engineer, checks readings of instruments in daily road tour.

Accurate Pre-Cooling Control Sends

Better Fruit to Market

By William Bethell,
Assistant Manager, Placer Dist., American Fruit Growers Inc.

Arnold Challman,
Engineer Brown Instruments Division Minneapolis-Honeywell Regulator Co.

To get California fruit to Eastern markets at premium prices, quick chilling at point of production must be accurately controlled. The fruit is then ready for quick transportation in ice refrigerated cars where temperatures are uniformly maintained until arrival at destination.

A MECHANICAL refrigeration system for pre-cooling and packaging California fruit so it will arrive in eastern markets in uniformly higher qualities and bring premium prices and better profits has been put into operation by American Fruit Growers, Inc., national marketing organization shipping under the Blue Goose label.

Conversion to mechanical refrigeration pre-cooling, including use of Brown electronic throttler-type controllers for maintaining precise temperatures for each type of fruit, is being carried out in the Blue Goose organization's Newcastle, Loomis, Auburn, Tudor and Westside, Calif., warehousing facilities. Fruit shipped from these areas has reached its destination without over-ripening, down grading and spoilage which was experienced under former conditions. California fruit destined for transcontinental rail shipment East is precooled before loading into ice-refrigerated railroad cars. The present cars, capable of holding the fruit at a uniform low temperature during the cross-country run, do not provide for reduction of temperature rapidly to that required to insure minimum spoilage, uniform ripening and top quality upon delivery.

Typical of the method being used now and the results is that found in the handling of plums. The new procedure requires that the grower pick the plums during the day and bring them to the American Fruit Growers station around 5:00 o'clock in the evening. As fast as the plums are received, they are placed in the quick chill room.

The temperature of the plums is reduced in the chill room to 32 F in 15 hours. They are then loaded into refrigerated railroad cars in which they are held at this temperature until they arrive at the eastern terminus where American Fruit Growers, Inc., may auction them to the highest bidder at prices which are based on the condition of the fruit. For this reason, the optimum in automatic temperature control equipment is required.

The quick chill temperature level of 32 F is extremely critical. Should the temperature drop below the 32 F level and cause freezing, brown spots would appear on the plums as they ripen in transit, and, as a result, spoil-

age and loss would ensue. If the plums are insufficiently chilled, they become overripe and spoil before reaching their destination.

Pears are rapidly graded and sorted by girls prior to crating of fruit.

Refrigerating Systems and Controls

The refrigerating system is made up of standard elements including ammonia compressor, condenser and receiver. Blower operated, direct expansion refrigerating units are employed in the chill rooms. The refrigerant feed to these units is regulated by a Belmont liquid lend control, installed on a surge drum, which operates a Hubbell solenoid valve. A hand expansion valve is set to control the liquid feed quantity when the stop valve is open.

The pressure of the ammonia in the refrigerating unit is controlled by a Hubbell evaporator pressure regulator which does not however control to a set pressure. This back pressure valve is of a design that can be regulated by pneumatic control, which is provided by a Brown electronic throttling type controller. Thus the evaporator pressure is regulated to maintain an exact temperature in the chill room rather than to remain at or above a fixed pressure. In this way the precooling operation can be carried on at maximum speed as long as the temperature of the room remains at or above the set point.

To measure the temperature within the quick-chill room, at least four thermocouples are installed at strategic locations on the inside of the room. These are connected through a multiple selector switch to a Brown electronic potentiometer equipped with a throttler-type control unit.

In operation, the selector switch is left in a position which connects the control thermocouple to the potentiometer. Deviations of temperature from the set point (32 F), as measured by the control thermocouple, produce changes in the pen and indicator position of the potentiometer. Since these are mechanically linked to the throttler control unit, the throttler unit produces air pressure in proportion to the temperature deviations. The back-pressure valve reacts to the changes in air pressure by changing the flow of refrigerant through the evaporator to a degree necessary to restore the temperature to the set point.

The temperatures at various points in the quick chill room can be ascertained by manipulating the selector switch. This makes possible periodic checking for uniform temperature distribution. The temperature can be controlled by any of the various couples which can be either in the air blast or return air, according to which point is selected. This is highly important in averting losses resulting from insuffcient or over-chilling in certain areas within the precooling room.

View into refrigerated chill room showing pallets of "Blue Goose" label fruit crates. Electronic controller and thermocouple selector switch are shown maintaining precise 30.5 F temperature in this room.

The installation of the refrigerating systems regulated by the electronic controllers in American Fruit Growers warehousing facilities has proved eminently satisfactory. Plums shipped out of these areas have brought a premium price in the New York market in comparison to other plums shipped from facilities employing other methods. As a result, both the growers and the ultmate consumer have benefited.

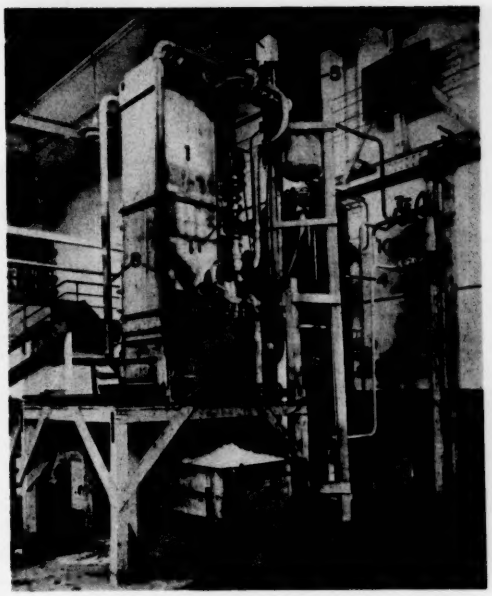
Rental Plan Places Appliances For Florida Ice Company

A RENTAL plan by the City Products Corporation of Miami, Fla., during the months of December and January placed 1,616 ice-using appliances in the company's thirty odd ice plants in the State of Florida. The majority of these rentals were domestic ice refrigerators, but a number of commercial units were placed in stores and markets for displaying iced poultry, meat, fish and vegetables. The company had set as a goal the placing of 10,000 units before the plan is completed and it is already on its way to realize this figure.

The Florida plants of the company are divided into four units, each competing against the other for top honors in this contest. The northern division with headquarters in Daytona and 16 plants had reported 687 rentals as of January 26. The southern division with headquarters in Miami and nine plants, reported 627 rentals in the same period. The western division with four plants and headquarters in Ft. Meyers, had placed 198 rentals; and the Chicago division, with plants at Lakeland and Jacksonville, had placed 59.

To supply ice in sized form for the Continent, a Swiss manufacturer is building refrigerating equipment to produce so-called "chip ice" in small tubular, hollow pieces. Operating features of the equipment are described in this article.

Making "CHIP-ICE" In Switzerland



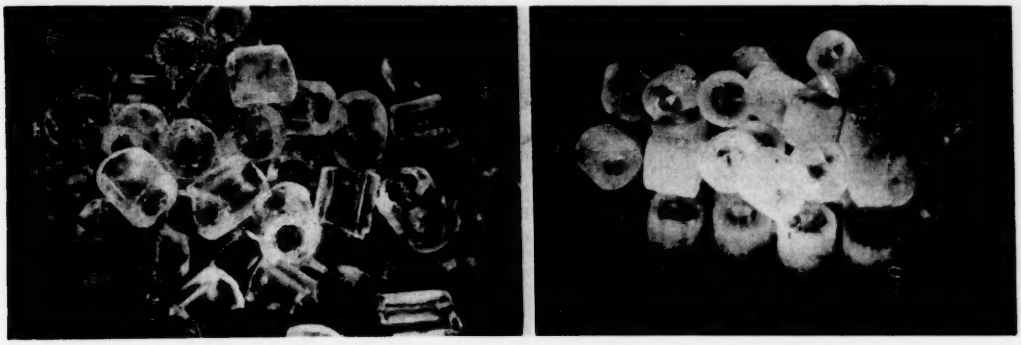
Escher Wyss chip-ice installation working entirely automatically, with capacity of 1000 kgs. (2,205 lbs.) per hour. (1) Ice generator comprising 10 standard elements each having 10 tubes. (4) Heat accumulator for hot ammonia gas. (5) Liquid separator. (7) Reservoir for freezing water. (8) Pipes for the circulating freezing water. (9) Container for the finished chip-ice. (10) Automatic regulator. (11) Quick-closing valve. (12) Two change-over valves. (13) Circulating pump for freezing water.

PRODUCTION of so-called "chip-ice" for commercial and industrial use has been accomplished with the use of special refrigerating equipment built by Escher Wyss, Ltd., Zurich, Switzerland. Swiss markets for this form of ice are chemical plants, fisheries, extensive concrete work, and other operations that need ice in small pieces that are not excessively hard, and supplied continuously and automatically.

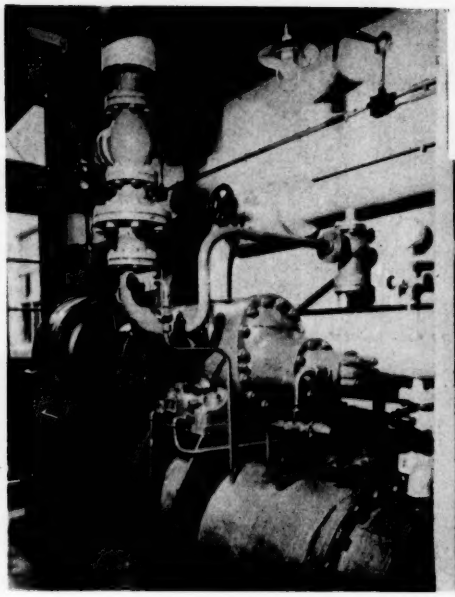
In these installations, the ice generator works intermittently and discharges the ice at intervals of 10 to 20 minutes into the collecting container. The duration of the freezing periods can be changed as required and consequently also the thickness of the chip-ice that is produced. An important component is the automatic thawing device. The ice generator is equipped with a special heating zone fitted in the lower section of the generator and contributes considerably to the reliable working of the system.

Heating Medium

Compressed ammonia vapors act as heating medium, with which there is no danger of freezing as would be the case if, for example, hot water were used for thawing. In order to reduce the losses of cold and heat to a minimum it is necessary to supply to the generator in a very short time the largest possible quantity of heat for the thawing process. For this purpose Escher Wyss ice generators are equipped with sufficiently large heating gas accumulators which supply most of the heat first to the heating zone and then to the evaporator chambers.

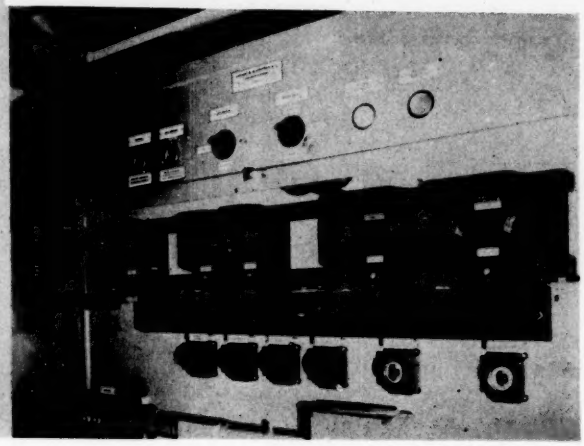


Cylindrical ice is produced in pieces of even length by chip-ice equipment as required, in the form of clear ice, at the left, or of opaque ice, at the right.



Left: The Rotasco compressor in Escher Wyss chip-ice plant installations. This compressor operates alternately as refrigerating machine for ice production and as heat pump for thawing ice from freezing elements.

Right. Continuous operation without attendance is made possible by this fully automatic control equipment.



Thawing Process

When switching over to the thawing process, the main valve is opened in about four seconds by a quick-closing valve and the heating gas is introduced to the evaporators within the same space of time. In seven to ten seconds the ice has become released and begins to fall down from the freezing tubes. The whole thawing period, including switching over, lasts only 60 seconds. During the thawing process the compressors remain in operation. The liquid, cold ammonia, present during the freezing process in the space around the evaporating tubes is led within a few seconds to the liquid separator when switching over to the thawing process and cooled down further in the liquid cooler during the above mentioned thawing action.

The return to the evaporator of the ammonia that has been cooled to a low temperature likewise takes place within a few seconds. The water circulation is shut off automatically before commencement of the thawing phase. After all the ice[1] has been removed from the freezing tubes, the water circulation again sets in automatically. The ice falls on to perforated chutes after thawing. Apart from these chutes automatic closing devices are fitted on both sides of the evaporator.

Test Run Proved Merits

The first plant of this kind proved its merits during a test run of more than ten weeks duration and at first, it operated both day and night. Transport of the chip-ice can be effected in a hand truck operating in conjunction with a small-size electric hoist and is thus very simple. Such equipment can, of course, also be replaced by automatic conveyors.

These installations, according to Escher Wyss, have a high efficiency, require small space, and have a favorable rate of production. They also offer an advantage in the elimination of brine as an intermediate refrigerant and of ice molds requiring maintenance. Initial costs, it is stated, are less than for a plant producing block ice.

Continuous Production

The production of ice is continuous, day and night operation if desired, and aside from occasional supervision, does not call for any attendance since all phases of production are controlled automatically. The large ice surface provides an intensive cooling effect and the curved surface of the chips with small radius very largely reduces the danger of caking.

The work on installation of these plants has proceeded continuously since this new chip ice process was developed, according to the manufacturers. Recent completion of two industrial types of plant was the result of research work carried out to perfect the process of production.

British Fisheries Use Ice

A MAJOR development in the British ice manufacturing industry is supplying ice to fishing interests in northern England, according to a news note in "Modern Refrigeration", London, England. Construction of big fishing plants around the northeast coast of Scotland as a method of perserving surplus fish was advocated by W. S. Dukin, Unionist candidate for Banffshire, in a recent speech. This policy, he said, would provide a market for surplus catches and maintain supplies of fish regularly throughout the year. He also advocated considerable expansion in the extraction of edible oils from herring. Both policies have been developed to a limited extent with the Herring Industry Board particularly active. Large scale development is still pending, however, the major problem being the high capital cost required for the limited seasonal turnover and the difficulty of finding other commodities in those areas to maintain plants in operation during the off seasons.

Ice Prices for 1950---About the Same as 1949 Volume of Processed Ice Grows

Publication of ice prices established by representative ice producers in all sections of the country has been an annual feature of ICE AND REFRIGERATION for more than fifty years. The discussion and tabulation presented here gives a complete listing of prices for all classes of ice for 1950. In this report special attention is directed to the upward trend in the number of distributors selling the more modern forms of ice. This applies to processed ice, for reicing produce trucks and through vending stations. More than 93 percent are selling sized ice as compared to 80 percent last year. Reicing of produce trucks shows an increase of 20 percent. Vending stations are coming into the picture at an accelerated rate—an estimated increase in number of about 34 percent over last year.

ICE prices for 1950 show a tendency to remain practically the same as for 1949, with only slight increases or decreases for various classes such as domestic delivered, commercial, dealers, and car icing, also the usual fluctuations between sections. The average for all delivered ice shows a very slight increase over the last year, the average for all wholesale ice shows a slight decrease and all boils down to a grand average for all ice that is only .02 cents per ton less than the similar grand average established for 1949.

There is no definite pattern as regards higher or lower prices, except the trend toward slightly more for delivered ice and slightly less for wholesale ice. But these differences are so slight as to be for all practical purposes, negligible.

Increases and Decreases

For instance Table I giving average price of ice in states by groups, shows a slight increase in the Eastern states for domestic and light commercial but a decrease for all the other classes. The Southern states show the same for domestic, a decrease for light commercial, heavy commercial and dealers; an increase for car icing and a decrease for carload lots. The Midwestern states show an increase for domestic, light and heavy commercial; a sharp decrease for dealers, a slight increase for car icing and a considerable decrease for carloads. The Western states show an increase for domestic and light commercial and a decrease for heavy commercial, car icing and carload lots, and a substantial decrease to dealers.

It is also interesting to note the wide spread between high and low prices as shown in Table VII. For the domestic trade this spread is as much as 47 cents per 100 pounds in the Western states. This section also shows wider spreads than any of the others in all classes amounting, in the case of dealers, to $5.00 per ton.

These price quotations are based upon reports received from 274 ice distributors located in 48 states, the District of Columbia and Canada. The information in these reports is summarized in the following analysis and tables. In the main tabulation reports on prices are given for representative cities in all sections of the country. Since ice makets comprise both small and large cities, the prices shown here may be considered as average. These averages are arithmetical and not weighted since it is obvious that it would not be possible to obtain actual tonnage figures on such a large number of classifications representing both large and small markets.

The smaller tables following this large table give summaries and breakdowns for the different sections and for the six main classifications of ice prices.

Chart Shows Twenty Year Trend

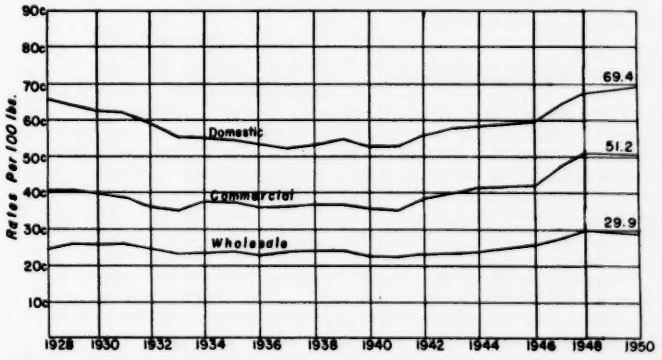
The fact that only slight changes have been made in the prices for ice over the last twenty years is shown by the chart below, with average prices for domestic, commercial and wholesale ice every year since 1930. It shows a gradual upward trend starting in 1941, but that the present prices are only slightly higher than 1930, twenty years ago. It also shows a leveling off tendency starting in 1949.

Contract Ice

Sales of ice by contract show a decline over many previous years, 28 of the 274 plants reporting use of this plan as compared to 33 of the 288 plants reporting last year. Most of them are on a yearly basis both winter and summer, but two reported a contract available for summer only and one for winter only.

Sized and Crushed Ice

Again this year reports on sales of sized and crushed ice show a con-



Trend of average prices for domestic, commercial and wholesale ice for twenty years, 1930-1950.

tinued upward trend in volume and slight increases in prices. Of the 274 plants reporting 256 report sales of sized ice as compared to 230 of 288 plants reporting last year. Sales of both sized ice and cubes are reported by 106 plants and of sized ice only by 133 plants.

The price range for commercial sized ice is from 35 cents to $1.50 per 100 lbs, with an average of 67.8 cents, an increase for the average of 5 cents over last year. Last year the range was from 40 cents to $1.40 per 100 lbs. with an average of 62.8 cents. In 1948 the average price was 63 cents. Seventeen distributors reported a price of $1.00 per 100 lbs. and nine reported low prices of 40 cents or less.

Prices per 100 lbs.

The trend toward quoting prices on basis of 100 lbs. is quite pronounced in this year's returns, only 17 quoting prices per ton, per bushel, or other bases. The price range per bushel is from 30 to 86 cents with an average of 43.6 cents; per ton is from $5.50 to $14.00 with an average of $9.83. Other quotations are 45 cents for a 50 lb. bag and one cent per lb.

For sized ice to the domestic trade the price range is from 50 cents to $2.00 with an average price of 82.1 cents per 100 lbs. Last year the range was from 50 cents to $1.60 with an average price of 79.5 cents. In this classification also the trend is definitely toward establishing prices on basis of 100 lbs. Only 14 quotations were on bushels, tons or other classifications, compared to 23 last year. For bushels the price range is from 40 cents to $1.00 with an average of 58.3 cents. Only one quotation per ton was $16.00. Other quotations are 55 cents for a 55 lb. bag, one cent per pound, 40 cents for a 25 lb. bag, 80 cents for 50 lb. bag, 35 cents for 25 lb. bag, 25 cents for 15 lb. bag, 50 cents per 25 lb. bag, special delivery.

Differential from Block Ice

The tendency toward establishing prices for sized ice that are slightly higher than block ice continues. One prevailing practice is to charge about 10 cents more per 100 lbs. for sized ice, although some charge more and some charge less. A Mississippi plant sells sized ice to its commercial trade at the established block ice price, but charges the domestic trade 10 percent more. An interesting comparison in this connection is the fact that the overall average for light commercial ice shown in Table VI (for block ice) is 58.6 cents per 100 lbs, while the average shown above is approximately 67.8 cents, a differential of slightly less than 10 cents per 100 lbs.

Volume of Processed Ice

The volume of processed ice continues to increase, according to these reports. The volume of sales estimated for 1950 show approximately the same increase over 1949 as 1949 did over 1948. In 1948 (111 plants reporting) 230,429 tons of ice were sold, an average of 2166 tons per plant. In 1949 (121 plants reporting 273,136 tons of ice were sold, an average of 2259 tons per plant. It might be noted in passing that 1949 production was estimated in last year's report as 1900 tons—a considerable underestimate. Estimated sales for 1950 (120 plants reporting) are 311,052 tons, an average of 2,592 tons per plant.

A New Mexico concern commenting on the growing popularity of processed ice says that almost all of its commercial trade is shifting to this form.

Sales of Ice Cubes

Sales of ice cubes appears to have no big ups or downs. Sales in this form are reported by 106 plants as compared to 103 last year. The price range for commercial use is from 60 cents to $2.00 with an average of of $1.05 per 100 lbs. compared to a range of 50 cents to $2.00 with an average of $1.26 last year and an average of $1.10 the year before. Selling cubes by the bushel still remains popular, 32 concerns making such quotations. The range is from 50 cents to $1.25 with an average of 82.4 cents per bushel, compared to 50 cents to $1.60 and an average of 82.8 cents last year. Other typical quotations are: 50 lbs. 60 cents; 25 lb. bag 70 cents; 35 lb. bag, 50 cents; 50 lb. bag, 75 cents.

Domestic Trade

For the domestic trade, the price range per 100 lbs. is from 70 cents to $3.00, with an average of $1.47. Last year the range was from 50 cents to $3.60, with an average of $1.53. The average in 1948 was $1.41. There is a noticeable trend here toward quoting on a 100 lb. basis, although many concerns retain the bushel and other bases. Twenty-eight quotations were per bushel, with a range of 50 cents to $1.50 and an average of $1.02. Last year the range was from 70 cents to $1.50 and an average of $1.06. Other typical quotations are: 35 lbs. for $1.00; 100 cubes for 35 cents; 40 lb. bag for $1.00; 25 lb. bag for 70 cents; 10 lb. bag for 25 cents; 60 cubes for 25 cents; 100 cubes for 50 cents.

Fruit and Vegetable Icing

Only a slight increase over last year is shown in the number of concerns selling sized ice for fruit and vegetable icing to retail stores and gardeners and shippers. Of the 274 concerns, 204 reported such sales compared to 193 out of 288 concerns last year. The price range to retail stores is from 30 cents to $1.50 with an average of 65.2 cents per 100 lbs. Last year the range was from 30 cents to $1.40, with an average of 61.3 cents and the year before the average was 58.7 cents. For gardeners and shippers the price range is from $3.25 to $14.00, with an average of $8.06 per ton compared to $4.00 to $12.00 with an average of $7.80 per ton last year and an average of $8.10 the year before.

Reicing Produce Trucks

Sales of crushed ice for reicing produce trucks continue their upward trend, with 178 of the 274 concerns reporting prices on this class of business, compared with 131 of the 288 concerns reporting last year. The price range is from $4.20 to $12.00 with an average of $7.89 per ton. Last year the range was from $3.15 to $14.00, with an average of $7.79 per ton. Nineteen concerns reported prices on basis of 100 lbs. ranging from 30 to 90 cents, with an average of 48 cents per 100 lbs.

Vending Stations Show Increase

For the first time information was requested this year on the number of vending stations used in 1949 and the number in use or to be installed in 1950. Seventy-three companies reported 187 in operation during 1949 an 84 reported that they expected to have 250 in operation during 1950.

Percentage of Ice Sold for Domestic, Commercial—Other Uses

Reports on the percentage of ice sold for different purposes show the following average (arithmetical not weighted): domestic 45.9 percent, commercial 43.2 percent, other uses 10.9 percent. Last year's report showed: domestic 52.1 percent, commercial 38.6 percent, other uses 9.3 percent.

(For additional details see page 28)

Annual Report of Ice Prices

Ice Prices Established for 1950 by Leading Ice Distributors in the More Important Cities in United States and Canada—Shows Slight Increases Over Last Year

CITIES	Domestic Trade per 100 lbs. Delivered				Commercial Trade Delivered		Cash Sales at Sales Stations and Platform, per 100 lbs.					Wholesale Trade per 100 lbs. and per ton					
	Over 100 lbs.	Under 100 lbs.	Coupon Books / Rate per 100 lbs. or % discount	Minimum Delivery, lbs.	200 lbs. per delivery to 1500 lbs. per week per 100 lbs.	1500 lbs. per week to Truck lots per ton	25 Pounds	50 Pounds	100 Pounds	300 Pounds	Ton Lots	Ice Cream Mfrs., Fish Dealers, etc.	Peddlers and Dealers at Platform	Icing Cars in R. R. Yards	Icing Cars at Plant	Reicing Produce Trucks	Car Load Lots Mf'd Ice f. o. b. Plant
ALABAMA																	
Birmingham	.60	.60	No disc.	25	.50	10.00	.52	.50	.50	.45	.....	....	6.00	.....	.....	.....	.....
Gadsden	.60	.60	None	25	.50	7.50	.60	.60	.50	.40	7.50	....	5.00	.....	.....	8.00	.....
Greenville	.70	.70	Cash disc.	..	.60	8.00	....	....	.60	....	6.00	....	.....	.....	.....	8.00	.....
Montgomery	.60	.60	No disc.	12½	.50	8.00	.52	.50	.50	.40	7.00	.50	7.00	.....	.....	7.00	.....
Opelika	.60	.60	No disc.	25	.60	8.50	.60	.60	.60	.50	8.00	.60	6.00	6.00	None	8.00	6.00
Selma	.60	.60	Cash disc.	25	.40	6.00	.52	.50	.50	....	6.00	.30	5.50	6.00	.....	8.00	5.00
ARIZONA																	
Flagstaff	.75	1.00	.....	25	.75	13.00	1.00	.80	.75	.65	10.00	....	10.00	.....	.....	10.00	.....
Nogales	.....	.70	None	12½	....	6.50	.80	.70	.65	.45	6.50	....	.....	.....	6.50	6.50	5.00
Yuma	.70	.70	5%	25	.60	.....	.60	.60	.60	.50	8.00	....	.....	5.50	5.50	6.67	.....
ARKANSAS																	
Harrisburg	.60	.60	50	25	.40	8.00	.60	.60	.60	.60	.....	.60	5.00	.....	.....	.....	.....
Helena	.70	.70	Cash disc.	25	.60	12.00	.60	.60	.60	.60	10.00	.50	10.00	.....	.....	.....	.....
Jonesboro	.60	.60	5%	25	.60	12.00	.52	.51	.50	.50	.....	.60	6.00	.....	.....	.....	.....
Paragould	.53	.60	No disc.	25	.53	8.00	.52	.50	.45	.40	8.00	.53	6.00	.....	.....	.....	.....
Texarkana	.70	.70	No disc.	25	.60	.....	.60	.60	.60	.50	7.00	....	7.00	.....	.....	.....	.....
CALIFORNIA																	
Alturas	.90	1.00	None	25	.60	12.00	.80	.80	.75	.70	10.00	....	12.00	.....	.....	.....	.....
Blythe	.80	.80	None	25	....	8.00	.80	.80	.80	.60	8.00	....	7.00	5.50	.....	8.35	.....
Hanford	.70	.70	None	25	.60	.....	.80	.60	.60	.60	8.00	....	6.00	.....	3.75	8.00	3.50
Holtville	.75	.80	Cash disc.	25	.70	.....	.80	.80	.65	.55	11.00	.65	8.00	.....	.....	11.00	.....
Long Beach	.70	.70	Cash disc.	25	.45	12.00	.80	.70	.70	.70	6.25	.34	.....	.....	.....	.....	.....
San Diego	.80	.80	5%	25	....	.....	1.00	.80	.80	.75	13.00	....	7.00	.....	.....	.....	.....
San Jose	.80	.70	5%	25	.65	5.25	.80	.70	.70	.50	.....	....	.....	.....	.....	.....	.....
Santa Monica	.80	.80	No disc.	25	.60	6.00	.80	.80	.80	....	.....	.30	5.50	.....	.....	.....	.....
COLORADO																	
Boulder	.70	.80	Cash disc.	25	.60	.....	....	....	.65	.50	8.00	....	6.00	.....	.....	.....	.....
Denver	.70	.70	.....	25	.55	7.00	.60	.50	.48	.40	6.00	....	5.40	4.60	4.50	7.00	4.80
Greeley	.75	.80	5%	25	....	.....	.80	.70	.65	....	6.00	.65	7.00	5.50	5.00	6.00	.....
Longmont	.75	.80	Cash disc.	25	.60	7.00	.80	.64	.64	.64	12.00	.60	7.00	.....	.....	10.00	.....
Pueblo	.78	.78	Cash disc.	12½	.65	10.00	.80	.70	.55	.50	10.00	....	10.40	.....	.....	.....	.....
Sterling	.80	.80	.....	25	.70	12.00	.80	.70	.70	.70	10.00	....	8.00	.....	8.00	10.00	.....
CONNECTICUT																	
Bridgeport	.70	.70	No disc.	25	.60	12.00	.80	.70	.50	.50	10.00	.20	4.00	.....	8.00	8.00	.....
Mystic	.70	.70	None	25	.60	.....	.60	.60	.60	.60	6.00	.40	6.00	.....	.....	.....	.....
Norwalk	.60	.75	None	25	.55	9.00	.60	.50	.50	.40	6.00	.25	4.67	.....	.....	8.00	.....
Stanford	.70	.70	.....	25	.50	8.00	.60	.50	.50	.34	.....	.35	5.00	.....	.....	8.00	.....
DIST. COLUMBIA																	
Washington	.65	.80	.....	25	.65	8.00	.80	.80	.65	.45	7.00	....	5.34	8.00	.....	7.00	.....
DELAWARE																	
Dover	.60	.60	No disc.	25	.60	10.00	.60	.50	.50	.50	8.00	.60	6.00	.....	.....	8.00	.....
Milford	.55	.66	None	25	.50	8.00	.56	.56	.56	.40	8.00	.40	.....	.....	.....	8.00	.....
Wilmington	.70	.70	.....	25.	.55	9.00	.60	.56	.50	.40	8.00	....	6.00	7.50	7.00	6.60	4.00
FLORIDA																	
Fort Meyer	.68	.68	None	12½	.56	7.00	.56	.56	.56	.35	6.00	.30	6.80	.....	.....	7.00	.....
Orlando	.70	.70	.....	25	.60	10.00	.60	.60	.60	.50	8.00	.40	.....	.....	.....	8.00	.....
GEORGIA																	
Atlanta	.60	.60	No disc.	25	.50	8.00	.60	.50	.50	.40	6.00	.40	6.00	.....	.....	8.00	5.00
Augusta	.60	.60	No disc.	..	.50	8.00	.50	.50	.50	.50	7.00	.40	8.00	.....	.....	.....	5.00
Brunswick	.56	.56	No disc.	12	.56	11.00	.56	.56	.56	.56	8.00	.27	.....	7.00	5.00	8.00	5.00
Columbus	.60	.60	No disc.	..	.60	12.00	.60	.60	.60	.50	10.00	....	7.00	.....	.....	.....	.....
Gainesville	.60	.60	Cash disc.	25	.40	6.00	.40	.40	.40	.35	7.00	....	.....	7.00	.....	.....	.....
Griffin	.60	.60	No disc.	25	.60	8.00	.60	.60	.60	.60	.....	.50	6.00	.....	.....	8.00	.....
Macon	.60	.60	No disc.	25	.50	8.00	.50	.50	.50	.40	7.00	.30	.....	8.00	6.00	7.00	5.00
Valdosta	.50	.60	No disc.	..	.50	.....	.60	.50	.50	.....	.....	....	5.00	6.33	.....	6.33	.....
IDAHO																	
Boise	.80	.80	Cash disc.	25	.80	10.00	.80	.80	.80	.80	10.00	.70	7.00	.....	4.25	10.00	4.00
Caldwell	.80	.80	.....	25	.80	7.00	.80	.60	.60	.60	8.00	....	7.00	.....	.....	7.00	4.00
Pocatello	....	....	.....	..	....	.....	....	....	.50	.30	6.00	.35	5.00	.....	5.00	.....	.....
Twin Falls	.65	1.00	None	10c	.70	12.00	....	....	....	....	.....	....	7.00	5.00	.....	.....	.....

Annual Report of Ice Prices—Continued

CITIES	Domestic Trade per 100 lbs. Delivered				Commercial Trade Delivered		Cash Sales at Sales Stations and Platform, per 100 lbs.					Wholesale Trade per 100 lbs. and per ton					
	Over 100 lbs.	Under 100 lbs.	Coupon Books — Rate per 100 lbs. or % discount	Minimum Delivery, lbs.	200 lbs. per delivery to 1500 lbs. per week per 100 lbs.	1500 lbs. per week to Truck lots per ton	25 Pounds	50 Pounds	100 Pounds	300 Pounds	Ton Lots	Ice Cream Mfrs., Fish Dealers, etc.	Peddlers and Dealers at Platform	Icing Cars in R. R. Yards	Icing Cars at Plant	Reicing Produce Trucks	Car Load Lots Mf'd Ice f. o. b. Plant
ILLINOIS																	
Belleville	.68	.68	No disc.	25	.58	.....	.60	.60	.60	.60	.....	....	6.00	.....	.....	.....	.....
Bloomington	.64	.64	No disc.	25	.55	11.00	....	....	.50	.50	10.00	.30	5.50	6.00	.....	8.00	5.00
Champaign	.60	.60	2%	25	.60	12.00	.60	.50	.50	.50	5.50	....	6.00	6.00	5.00	9.00	.....
Chicago	.60	.75	No disc.	25	.45	7.00	.50	.50	.50	.50	6.00	.25	5.00	5.50	5.00	.....	4.50
Dixon	.70	.70	Cash disc.	25	.60	.....	.60	.60	.60	.60	6.00	....	6.00	7.50	.....	.....	.....
Salem	.68	.68	No disc.	25	.58	9.00	.60	.60	.60	.60	.....	....	6.00	.....	7.00	8.00	4.50
Springfield	.60	.60	No disc.	25	.50	10.00	.60	.60	.60	.60	8.00	.35	6.00	8.25	6.25	8.00	4.75
INDIANA																	
Gary	.60	.75	.....	25	.50	8.00	.80	.70	.60	.50	10.00	.45	5.50	9.00	.....	10.00	.....
Greensburg	.70	.70	Cash disc.	25	.60	9.00	.60	.60	.60	.50	10.00	....	5.00	7.00	6.00	10.00	.....
Hammond	.70	.70	None	25	.60	10.00	.60	.50	.50	.50	10.00	....	5.00	10.00	.....	10.00	.....
Indianapolis	.70	.70	No disc.	25	.65	7.00	.60	.60	.60	.47	7.00	....	7.00	5.50	5.00	7.00	4.00
Kokomo	.70	.70	No disc.	25	.60	5.50	.60	.60	.60	.50	12.00	.50	5.50	12.00	.....	10.00	4.50
Lafayette	.70	.70	Cash disc.	25	.55	10.00	.60	.60	.60	.50	8.00	....	.....	8.00	.....	8.00	.....
New Albany	.60	.60	None	25	.50	5.00	.60	.50	.50	.40	.....	....	6.00	.....	.....	8.00	.....
New Castle	.70	.70	.....	..	.50	8.00	.60	.60	.60	.50	10.00	....	.....	.....	.....	.....	.....
South Bend	.70	.70	No disc.	25	.60	8.00	.60	.60	.60	.60	12.00	....	6.00	8.00	.....	9.00	.....
Southwestern	.72	.72	.....	25	.60	9.38	.72	.70	.70	.45	9.00	.45	6.00	.....	6.00	9.00	.....
Terre Haute	.60	.60	.....	25	.50	10.00	.60	.60	.60	.60	8.00	.50	6.00	6.00	6.00	8.00	6.00
IOWA																	
Centerville	.70	.70	5%	25	.55	6.00	.60	.60	.60	.50	8.00	.50	5.00	8.00	5.50	8.00	5.00
Clinton	.60	.60	No disc.	25	.50	9.00	.52	.52	.50	.50	10.00	.50	.....	.....	.....	.....	.....
Dubuque	.70	.70	No disc.	50	.60	10.00	.80	.60	.60	.60	4.50	.40	4.50	7.00	7.00	10.00	4.50
Guttenburg	.60	.60	No disc.	..	....	10.00	.60	.60	.60	.50	10.00	.60	10.00	.....	.....	.....	.....
Sioux City	.60	.60	No disc.	25	.35	6.00	.60	.60	.60	.60	10.00	.30	6.00	.....	.....	6.00	.....
Keokuk	.60	.60	No disc.	25	.50	6.00	.60	.50	.50	.50	8.00	.50	6.00	6.00	.....	8.00	6.00
Oelwein	.70	.70	None	25	.60	.....	1.00	.70	.70	.60	10.00	.60	5.00	.....	6.00	6.00	.....
Waterloo	.70	.70	Cash disc.	25	.70	12.00	.60	.60	.50	.40	7.00	....	5.00	8.00	5.00	8.00	5.00
KANSAS																	
Atchison	.70	.80	No disc.	12½	.60	10.00	.60	.60	.60	.50	10.00	.50	7.00	5.50	.....	10.00	5.00
Hutchinson	.60	.60	No disc.	25	.52	9.60	.60	.52	.52	.52	8.00	.40	5.50	5.50	5.50	8.00	5.00
Junction City	.60	.60	No disc.	25	.55	10.00	.56	.50	.50	.45	.....	.65	6.00	8.00	.....	10.00	6.00
Lawrence	.60	.60	No disc.	25	.60	10.00	.60	.60	.60	.50	7.00	.30	6.00	.....	.....	8.00	.....
Manhattan	.60	.60	Cash disc.	25	.60	8.00	.60	.50	.50	.35	7.00	.40	6.00	5.75	5.75	6.00	4.75
Pittsburg	.60	.60	No disc.	25	.50	.....	.52	.50	.50	.40	6.00	.50	6.00	.....	.....	.....	.....
Wellington	.70	.70	.....	25	.70	6.00	.60	.60	.60	.50	6.00	....	.....	.....	6.00	6.00	6.00
Wichita	.68	.70	No disc.	12½	.50	9.00	.70	.68	.64	.50	9.00	.50	7.50	6.50	5.00	10.00	5.00
KENTUCKY																	
Danville	.70	.70	No disc.	12	.60	10.00	.60	.60	.60	.50	10.00	....	5.50	.....	10.00	8.00	.....
Louisville	.60	.60	No disc.	25	.45	8.00	.50	.50	.50	.34	6.00	....	6.00	6.50	8.00	8.00	3.90
Richmond	.70	.70	Cash disc.	25	.60	10.00	.60	.60	.60	.50	.....	.60	5.50	.....	.....	10.00	.....
Shelbyville	.50	.60	5%	25	.50	10.00	.60	.50	.50	.42	.....	....	5.00	.....	.....	.....	.....
LOUISIANA																	
Baton Rouge	.60	.60	5%	12½	.45	8.00	.52	.50	.50	.40	7.00	.40	6.00	8.00	7.50	8.00	5.00
Bogalusa	.50	.50	10%	10c	.42	8.40	....	.50	.50	.42	6.00	....	6.00	.....	6.00	8.40	.....
Houma	.40	.40	.....	..	.40	7.00	.40	.40	.40	.35	5.00	.25	5.00	.....	.....	5.00	5.00
Lafayette	.60	.60	.....	25	.40	8.00	.60	.60	.60	.40	8.00	.40	.....	.....	.....	8.00	.....
Lake Charles	.50	.60	5%	25	.50	10.00	.40	.40	.40	.40	8.00	.40	6.00	6.00	6.00	8.00	.....
Monroe	.60	.60	No disc.	25	.45	7.00	.60	.60	.60	.60	.....	.40	6.00	7.00	.....	7.00	.....
New Orleans	.60	.60	None	25	.60	9.00	.60	.52	.52	.45	7.00	....	5.50	6.40	.....	7.00	5.50
MAINE																	
Augusta	.60	.60	No disc.	25	.50	8.00	.60	.50	.50	.45	8.00	.40	4.50	.....	.....	.....	.....
Bangor	.70	.70	.....	33	.40	7.00	.60	.60	.60	.40	7.00	.35	5.00	6.00	.....	8.00	5.00
Rumford	.60	.60	None	25	....	5.00	.60	.50	.50	.42	6.00	....	5.00	.....	.....	.....	.....
Waterville	.80	.80	Cash disc.	25	.50	7.00	....	....	.30	....	.....	.35	.....	7.00	.....	.....	.....
MARYLAND																	
Frederick	.60	.60	No disc.	12½	.50	10.00	.60	.60	.50	.35	7.00	.30	4.25	.....	.....	7.00	.....
Frostburg	.50	.50	.....	50	.40	5.25	.60	.50	.50	.50	5.25	.40	5.25	.....	.....	5.25	.....
Salisbury	.70	.70	None	25	.60	10.00	.60	.60	.60	.50	8.00	.50	6.00	.....	.....	7.33	5.00
MASSACHUSETTS																	
Attleboro	.70	.70	.....	..	.60	.....	.52	.50	.50	.30	6.00	....	5.00	.....	.....	.....	.....
Greenfield	.70	.70	No disc.	25	.70	.....	.50	.50	.50	.40	8.00	.70	4.67	.....	.....	8.00	.....
Holyoke	.70	.70	.....	20	.60	8.00	.60	.50	.50	.40	.....	.40	5.00	8.00	.....	8.00	.....
Leominster	.70	.70	.....	30	.45	6.00	....	....	.60	.35	5.00	....	4.00	.....	.....	.....	.....
Lowell	.70	1.20	.....	30	.50	6.00	1.00	1.00	.50	.25	4.50	.25	5.00	.....	.....	7.00	.....
Medford	.75	.80	.....	25	.50	8.00	....	....	.50	....	.....	....	5.00	.....	.....	.....	.....

CITIES	Domestic Trade per 100 lbs. Delivered				Commercial Trade Delivered		Cash Sales at Sales Stations and Platform, per 100 lbs.					Wholesale Trade per 100 lbs. and per ton					
	Over 100 lbs.	Under 100 lbs.	Coupon Books — Rate per 100 lbs. or % discount	Minimum Delivery, lbs.	200 lbs. per delivery to 1500 lbs. per week per 100 lbs.	1500 lbs. per week to Truck lots per ton	25 Pounds	50 Pounds	100 Pounds	300 Pounds	Ton Lots	Ice Cream Mfrs., Fish Dealers, etc.	Peddlers and Dealers at Platform	Icing Cars in R. R. Yards	Icing Cars at Plant	Reicing Producer Trucks	Car Load Lots Mf'd ice f. o. b. Plant
MASSACHUSETTS—Continued																	
Springfield	.70	.70	.....	25	.60	6.00	....	....	.50	....	5.00	....	5.00	7.00	.....	.....	.....
Worcester	.70	.70	None	25	.60	4.50	.60	.50	.50	.25	5.00	.40	5.00	7.00	.....	.....	.....
MICHIGAN																	
Coldwater	.60	.60	No disc.	25	.50	8.00	.60	.60	.60	.50	6.00	.50	5.00	.....	.....	8.00	.....
Flint	.70	.70	Cash disc.	25	....	10.00	.72	.70	.70	.70	....	.50	6.50	.....	.....	.....	.....
Jackson	.70	.70	No disc.	25	.60	9.00	....	....	.60	.40	7.00	.60	.....	8.00	.....	10.00	.....
Lansing	.60	.60	No disc.	25	....	11.00	.52	.50	.50	.42	7.00	....	6.60	9.00	.....	7.00	.....
Manistee	.70	.70	No disc.	25	.55	11.00	.60	.60	.60	.60	....	.55	8.00	.....	.....	9.00	.....
Owosso	.70	.70	No disc.	25	.70	8.00	.72	.70	.70	.70	14.00	.70	6.00	6.60	.....	10.00	.....
South Haven	.70	.70	No disc.	25	.70	12.00	.80	.70	.70	.70	8.40	.45	6.20	7.25	.....	8.40	.....
Traverse City	....	....	.....	..	....	.....	.60	.60	.60	.60	12.00	.50	6.00	.....	10.00	10.00	.....
MINNESOTA																	
Albert Lea	.65	.80	Cash disc.	25	.50	10.00	1.00	.70	.65	.50	12.50	.65	.....	.....	5.00	10.00	.....
Minneapolis	.70	.70	No disc.	25	.60	10.00	.60	.60	.60	.60	6.00	.30	5.15	5.00	5.00	6.00	4.00
New Ulm	.75	1.00	.....	35	.75	.....	....	....	....	....	.....	....	.....	.....	.....	.....	.....
Red Wing	.70	.70	.....	25	.60	8.00	.60	.60	.60	.60	12.00	.30	5.50	8.00	6.00	8.00	5.00
Rochester	.75	.80	No disc.	25	.70	12.00	.60	.50	.50	....	.....	....	5.00	6.00	.....	10.00	.....
St. Paul	.70	.70	.....	25	.60	11.00	.60	.60	.60	....	.....	....	5.00	.....	.....	.....	.....
MISSISSIPPI																	
Columbus	.60	.60	10%	25	.54	.....	.50	.50	.50	.50	.....	.30	6.00	6.00	.....	6.00	.....
Eupora	.60	.60	No disc.	25	.40	.....	.60	.60	.60	.40	6.00	....	6.00	.....	.....	6.00	.....
Grenada	.60	.60	Cash disc.	12½	.60	9.00	.60	.60	.60	.60	.....	.50	6.50	10.00	10.00	8.00	.....
Jackson	.70	.70	Cash disc.	12½	.50	9.00	.60	.60	.60	.60	10.00	.45	6.00	7.00	.....	7.00	.....
Vicksburg	.70	.70	No disc.	25	.60	8.00	.60	.60	.60	.60	8.00	.50	8.00	.....	.....	8.00	.....
MISSOURI																	
Carthage	.50	.60	No disc.	25	.50	10.00	.60	.60	.50	.35	7.00	.35	5.50	5.50	5.50	7.00	5.00
Columbia	.65	.65	Cash disc.	25	.55	9.00	.60	.60	.50	.50	.....	.30	7.20	.....	.....	.....	.....
Joplin	.60	.60	No disc.	25	.50	10.00	.60	.60	.60	.35	6.00	....	6.00	.....	.....	.....	.....
Kansas City	.55	.70	No disc.	25	.55	11.00	.60	.60	.60	.50	10.00	.50	7.00	6.00	.....	7.00	4.75
Marshall	.70	.70	Cash disc.	25	.60	8.50	.80	.60	.60	.45	6.50	.60	6.50	5.00	.....	6.00	.....
St. Louis	.70	.70	No disc.	25	.50	8.00	.60	.60	.60	.60	6.25	....	6.25	.....	.....	10.00	4.50
MONTANA																	
Billings	.60	.70	None	25	.40	5.00	.60	.50	.50	.42	5.00	.40	5.00	5.00	5.00	5.00	5.00
Butte	.80	.90	Cash disc.	25	.60	7.00	.80	.60	.60	.60	7.00	....	4.50	8.00	8.00	8.00	6.00
Great Falls	.80	1.00	No disc.	50	.80	.....	.50	.50	.50	.45	9.00	.50	9.00	.....	.....	.....	.....
Helena	.80	.80	No disc.	25	.60	12.00	.60	.60	.60	.60	12.00	....	.....	.....	.....	.....	.....
Lewistown	.70	.70	Cash disc.	25	.70	.....	.60	.60	.60	.40	6.00	....	.....	.....	.....	.....	.....
NEBRASKA																	
Hebron	.60	....	10%	..	.50	8.00	.80	.60	.60	.60	8.00	....	.....	.....	.....	8.00	.....
Omaha	.60	.60	No disc.	25	.50	8.00	.60	.50	.50	.40	5.00	.50	5.00	5.50	.....	8.50	4.00
NEVADA																	
Boulder City	1.40	1.40	.....	25	1.40	.....	1.20	1.20	1.20	1.20	.....	....	.....	.....	.....	.....	.....
Reno	.70	.80	.....	25	.60	8.00	1.00	.70	.60	.50	6.00	.35	.....	.....	.....	.....	4.50
NEW HAMPSHIRE																	
Bristol	.65	.65	.....	15c	.60	.....	....	....	.55	....	5.00	....	.....	.....	.....	.....	.....
Derry	.90	.90	None	..	....	.....	.90	.90	.90	.90	.....	....	.....	.....	.....	.....	.....
Manchester	.60	.70	5%	20c	.50	8.00	.60	.50	.40	.30	6.00	.35	5.50	7.00	.....	.....	.....
NEW JERSEY																	
Asbury Park	.80	.80	Cash disc.	25	.70	12.00	....	....	....	....	.....	....	.....	.....	.....	.....	.....
Glassboro	....	....	.....	..	....	.....	.80	.70	.65	.55	.....	.45	5.33	5.50	5.50	6.33	.....
Hackettown	.50	.60	None	30	.50	7.00	.50	.50	.50	.33	7.00	.40	4.55	8.75	7.00	7.00	5.25
Mt. Holly	1.00	1.00	.....	25	.80	12.00	.60	.60	.60	.33	7.00	.60	12.00	.....	.....	7.50	.....
NEW MEXICO																	
Santa Fe	.70	.70	No disc.	25	.70	10.00	.80	.62	.60	.50	10.00	.60	10.00	.....	.....	10.00	.....
Tucumcari	.80	.80	None	25	.70	12.00	.80	.70	.70	.60	10.00	....	.....	.....	5.50	10.00	5.00
NEW YORK																	
Auburn	.80	.80	No disc.	25	.70	12.00	.60	.60	.60	.60	8.00	.70	6.00	10.00	.....	8.00	.....
Binghamton	.70	.80	No disc.	25	.60	5.00	.60	.50	.50	.33	.....	....	6.00	.....	.....	6.00	.....
Kingston	.50	.60	None	25	.50	8.00	.40	.40	.40	.25	.....	.40	4.00	8.00	.....	6.00	.....
Lackawanna	.60	.60	None	25	.50	.....	.60	.60	.60	.30	6.00	.30	5.00	.....	.....	.....	.....
New York	.60	.60	None	50	.45	7.00	.40	.40	.40	.30	4.30	.25	4.30	7.00	4.30	7.00	4.30
Oswego	.80	.80	No disc.	50	.80	12.00	.80	.70	.70	.70	14.00	.50	6.00	12.00	9.00	10.00	6.00
Poughkeepsie	.60	.60	.....	25	.50	8.00	....	....	....	....	.....	....	.....	.....	.....	.....	.....
Rochester	.80	.80	No disc.	25	.80	10.00	.80	.70	.70	.60	.....	....	6.33	12.00	.....	9.00	.....

CITIES	Domestic Trade per 100 lbs. Delivered				Commercial Trade Delivered		Cash Sales at Sales Stations and Platform, per 100 lbs.					Wholesale Trade per 100 lbs. and per ton					
	Over 100 lbs.	Under 100 lbs.	Coupon Books — Rate per 100 lbs. or % discount	Minimum Delivery, lbs.	200 lbs. per delivery to 1500 lbs. per week per 100 lbs.	1500 lbs. per week to Truck lots per ton	25 Pounds	50 Pounds	100 Pounds	300 Pounds	Ton Lots	Ice Cream Mfrs., Fish Dealers, etc.	Peddlers and Dealers at Platform	Icing Cars in R. R. Yards	Icing Cars at Plant	Reicing Produce Trucks	Car Load Lots Mf'd Ice f. o. b. Plant
NEW YORK—Coutinued																	
Syracuse	.65	.70	Cash disc.	25	.62	9.00	.60	.50	.50	.45	8.00	....	6.00	6.00	.....	7.00	.....
Troy	.70	.70	None	25	.50	7.00	.60	.60	.60	.40	8.00	....	.....	.....	.....	.....	.....
Utica	.70	.80	.....	25	.60	6.00	.60	.50	.50	.40	6.50	....	6.00	6.50	.....	7.50	5.50
NORTH CAROLINA																	
Charlotte	.60	.60	No disc.	25	....	9.00	.60	.50	.50	.40	8.00	6.00	7.00	5.50	.....	8.00	.....
Goldsboro	.60	.50	No disc.	12½	.50	6.00	....	....	.50	.43	.....	....	6.00	10.00	.....	8.00	.....
Greensboro	.60	.60	No disc.	25	.50	9.00	.52	.50	.50	.45	8.00	....	6.00	.....	.....	7.00	.....
Henderson	.60	.60	No disc.	25	.50	8.00	.60	.60	.60	.50	8.00	.40	.....	.....	.....	8.00	.....
High Point	.60	.60	5%	25	.60	10.00	.60	.50	.50	.40	.....	....	5.00	.....	.....	.....	.....
Wilmington	.60	.60	No disc.	25	.55	8.00	.50	.50	.50	.30	5.00	.25	6.00	.....	.....	.....	.....
Winston Salem	.60	.60	No disc.	25	.60	10.00	.60	.50	.50	.35	7.00	.50	7.00	10.00	.....	7.00	5.00
NORTH DAKOTA																	
Bismarck	.80	.80	Cash disc.	25	.80	6.00	.80	.80	.80	.70	6.00	....	.....	.....	.....	6.00	6.00
Dickinson	.90	1.00	Cash disc.	15	.90	.....	1.00	1.00	.90	.90	.....	....	.....	.....	.....	.....	.....
Fargo	.70	.70	Cash disc.	25	.50	5.00	....	....	.50	....	4.00	....	.....	5.00	.....	.....	.....
Grand Forks	.80	.80	Cash disc.	25	.65	11.00	.80	.70	.55	.50	6.00	....	....	5.25	.....	.....	.....
Minot	.50	.50	No disc.	50	.40	6.00	.60	.50	.50	.50	7.00	....	5.00	4.00	.....	10.00	5.00
OHIO																	
Ashland	.60	.75	Cash disc.	25	.60	.....	.80	.60	.60	.42	7.00	....	.....	.....	.....	12.00	.....
Dayton	.70	.70	None	25	.70	12.00	.80	.60	.60	.45	.....	.90	6.50	.....	.....	.....	.....
Lima	.70	.70	No disc.	25	....	6.00	.60	.60	.60	.60	7.00	.35	5.25	6.50	8.00	8.00	.....
Mansfield	.70	.70	Cash disc.	25	.45	8.00	.60	.50	.50	.50	.....	.50	6.00	10.00	.....	10.00	.....
Middletown	.70	.70	.....	..	.60	8.00	....	....	....	....	....	....	.....	.....	.....	.....	.....
Springfield	.65	.70	Cash disc.	25	.55	.....	.60	.60	.55	.55	9.00	....	5.50	8.00	.....	.....	.....
Troy	.70	.70	No disc.	25	.60	10.00	.60	.60	.60	.50	.....	.60	6.00	.....	.....	.....	.....
OKLAHOMA																	
Ardmore	.60	.70	No disc.	12½	.55	7.00	.60	.50	.50	.40	7.00	.35	7.00	.....	.....	.....	.....
Bristow	.80	.80	No disc.	25	.80	14.00	.80	.70	.70	.40	.....	.70	7.00	.....	.....	8.00	.....
Enid	.80	.80	No disc.	25	.60	8.00	.72	.70	.70	.60	7.00	.40	7.00	7.00	6.00	9.00	5.00
O'Keene	.65	.70	None	..	.60	.....	.72	.70	.65	....	....	....	.....	.....	.....	.....	.....
Perry	.80	.80	No disc.	25	.70	.....	.72	.70	.70	.40	.....	....	8.00	.....	.....	8.00	.....
Ponca City	.80	.80	No disc.	25	.60	12.00	.80	.70	.70	.67	8.00	.30	8.00	8.00	7.00	8.00	.....
Purcell	.70	.72	No disc.	25	.60	....	.60	.60	.60	.40	.....	....	7.00	.....	.....	8.00	.....
Shawnee	.63	.70	No disc.	12½	.55	8.00	.60	.50	.50	.40	6.00	.33	6.50	6.25	7.00	8.00	.....
Tulsa	.71	.71	Cash disc.	....	.60	12.00	.60	.60	.60	.40	.....	.60	7.40	.....	7.50	.....	5.50
Walters	.65	.80	Cash disc.	12½	.50	.....	....	....	....	....	....	....	7.00	7.00	.....	8.00	.....
OREGON																	
Baker	1.00	1.00	Cash disc.	25	.60	12.00	.50	.50	.50	....	....	.60	.....	12.00	.....	12.00	.....
Bend	1.00	1.00	.....	..	1.00	8.00	1.00	1.00	1.00	.50	8.00	.50	8.50	7.00	.....	8.50	8.00
Klamath Falls	.80	1.00	5%	25	.90	10.00	.80	.80	.75	.75	.....	.50	8.00	8.00	5.00	8.00	4.00
Portland	.90	1.00	10%	25	.70	10.50	1.00	.90	.60	.42	6.50	....	5.00	6.50	6.50	10.00	5.00
PENNSYLVANIA																	
Bradford	.80	.80	No disc.	25	.50	.....	.80	.80	.80	.50	9.00	....	5.00	.....	.....	10.00	.....
Butler	.80	.80	No disc.	25	.60	8.00	.80	.60	.60	.50	8.00	.40	6.00	.....	.....	.....	.....
Connellsville	.70	.70	None	25	.60	10.00	.60	.50	.50	.45	7.00	....	6.00	.....	.....	.....	.....
Lancaster	.60	.60	None	25	.50	6.00	.70	.60	.60	.35	6.50	.37	5.50	8.00	5.25	6.25	6.00
Lebanon	.50	.50	None	20	.40	7.00	.50	.50	.40	.25	.....	.40	4.00	6.50	.....	5.00	4.00
Meadville	.70	.70	None	25	.55	6.00	.60	.60	.50	.42	6.00	....	5.00	6.00	.....	.....	.....
Reading	.65	.65	.....	25	.55	.....	.60	.50	....	.33	.....	.30	6.00	6.65	6.00	.....	.....
RHODE ISLAND																	
Black Island	....	....	.....	..	....	.....	.60	.50	.50	....	.....	....	5.00	.....	.....	.....	.....
Newport	....	....	.....	..	....	.....	.40	.40	.40	.40	.....	.20	4.00	.....	.....	.....	.....
Pawtucket	.65	.65	.....	30	.50	8.00	.60	.60	.50	.40	4.50	.30	4.00	8.00	.....	8.00	.....
Rumford	.70	.70	None	30	....	.....	....	....	....	....	.....	....	.....	.....	.....	.....	.....
SOUTH CAROLINA																	
Anderson	.60	.60	No disc.	25	.50	.....	.60	.60	.60	.50	10.00	.60	6.00	.....	.....	.....	.....
Camden	.50	.60	.....	..	.50	.....	.65	.60	.50	.40	.....	.40	6.67	.....	.....	.....	.....
Greenville	.60	.60	.....	..	.45	6.67	.60	.50	.50	.34	6.67	....	6.67	6.67	5.50	6.67	5.00
Newberry	.60	.60	None	12½	.50	10.00	.60	.60	.60	.50	10.00	.50	5.00	.....	.....	.....	.....
Sumter	.60	.60	10%	25	.54	8.70	.60	.60	.60	.60	.....	.43	8.60	9.00	6.00	7.00	5.00
SOUTH DAKOTA																	
Aberdeen	.80	.80	No disc.	25	.60	10.00	.60	.60	.60	.60	8.50	....	.....	.....	.....	.....	5.00
Gregory	.90	1.00	Cash disc.	35c	1.00	14.00	1.40	1.00	1.00	.83	14.00	....	.....	10.00	.....	.....	.....
Huron	.90	.90	No disc.	25	.75	8.00	.80	.80	.80	.75	7.00	....	.....	.....	.....	.....	.....
Rapid City	.70	.70	No disc.	25	.60	8.00	.68	.60	.60	.40	6.00	.60	6.00	6.00	.....	6.00	5.00
Sioux Falls	.80	.80	Cash disc.	25	.60	8.00	.80	.60	.60	....	.....	.50	6.00	5.50	5.50	6.00	3.50

Annual Report of Ice Prices—Concluded

CITIES	Domestic Trade per 100 lbs. Delivered				Commercial Trade Delivered		Cash Sales at Sales Stations and Platform, per 100 lbs.					Wholesale Trade per 100 lbs. and per ton					
	Over 100 lbs.	Under 100 lbs.	Coupon Books Rate per 100 lbs. or % discount	Minimum Delivery, lbs.	200 lbs. per delivery to 1500 lbs. per week per 100 lbs.	1500 lbs. per week to Truck lots per ton	25 Pounds	50 Pounds	100 Pounds	300 Pounds	Ton Lots	Ice Cream Mfrs., Fish Dealers, etc.	Peddlers and Dealers at Platform	Icing Cars in R. R. Yards	Icing Cars at Plant	Reicing Produce Trucks	Car Load Lots Mf'd Ice f. o. b. Plant
TENNESSEE																	
Greenfield	.60	.60	None	25	.50	8.00	.64	.62	.60	.40	6.50	....	.....	8.00	.....	8.00	6.50
Knoxville	.60	.60	.....	25	.60	10.00	.60	.50	.50	.50	.....	....	6.00	.....	.....	10.00	.....
Mt. Pleasant	.60	.60	5%	25	.60	8.00	.60	.60	.60	.50	8.00	....	.....	.....	.....	.....	.....
TEXAS																	
Brady	.70	.70	No disc.	25	.70	10.00	.60	.50	.50	.35	7.00	....	7.00	7.00	6.00	7.00	.....
Commerce	.....	.60	Cash disc.	12½	.53	10.50	.60	.60	.60	.40	.....	....	6.00	6.00	.....	6.00	5.50
Corpus Christi	.50	.60	No disc.	25	.50	7.50	.60	.50	.50	.40	5.50	.27	6.00	5.50	5.00	8.00	.....
Dallas	.60	.60	No disc.	25	.50	8.50	.52	.50	.50	.50	.....	....	5.50	6.00	.....	6.00	5.00
Denton	.60	.60	No disc.	25	.50	10.00	.60	.60	.60	.50	10.00	.35	6.00	.....	.....	10.00	7.00
Ft. Worth	.60	.60	No disc.	25	.50	10.00	.52	.50	.50	.50	10.00	.50	6.40	.....	.....	6.40	.....
Graham	.60	.60	No disc.	25	.60	.....	.60	.60	.55	.43	.....	.60	6.60	6.00	6.00	6.00	.....
Houston	.60	.60	No disc.	25	.60	9.00	.52	.50	.50	.....	.....	.30	6.00	.....	.....	8.00	.....
Greenville	.70	.70	No disc.	..	.70	.....	.72	.70	.70	.70	.....	....	7.00	.....	.....	.....	.....
Longview	.50	.50	No disc.	12½	.50	5.00	.52	.50	.50	.50	8.00	.35	5.00	.....	.....	8.00	.....
Overton	.60	.60	No disc.	25	.60	.....	.60	.60	.60	.60	.....	....	6.00	.....	.....	.....	.....
Rotan	.70	.80	.....	12	.60	9.00	.80	.70	.70	.57	.....	.70	7.33	.....	.....	.....	.....
UTAH																	
Ogden	.60	.70	No disc.	25	.40	8.00	.60	.50	.40	.35	5.00	.35	5.00	.....	.....	5.00	4.00
Salt Lake City	.65	.70	No disc.	25	.50	7.20	.15	.25	.50	.35	5.00	.36	5.00	.....	.....	.....	4.50
VERMONT																	
Brattleboro	.80	.80	Cash disc.	25	.70	8.00	.80	.70	.70	.65	8.00	....	7.00	.....	.....	.....	.....
Springfield	.60	.60	No disc.	25	.50	8.00	.60	.50	.50	.40	7.00	.30	6.00	.....	.....	.....	.....
VIRGINIA																	
Charlottesville	.70	.80	10%	10	.45	7.00	.80	.60	.50	.40	8.00	.45	6.00	6.00	6.00	7.00	6.00
Danville	.70	.70	No disc.	25	.55	.....	.72	.70	.70	.70	.....	.55	7.00	6.50	.....	11.00	.....
Farmville	.60	.70	Cash disc.	12½	.60	.....	.80	.60	.60	.60	.....	....	6.67	.....	.....	8.00	.....
Fredericksberg	.70	.70	No disc.	..	.70	.....	.72	.70	.65	.50	7.00	.70	5.95	.....	.....	7.00	.....
Hampton	.60	.60	Cash disc.	25	.60	7.00	.60	.60	.60	.45	7.00	.40	6.50	.....	.....	.....	.....
Hopewell	.60	.60	None	25	....	.....	.60	.60	.60	.45	.....	.60	.....	.....	.....	.....	.....
Winchester	.60	.60	10%	25	.50	8.00	.60	.60	.50	.45	7.00	.35	5.50	7.00	4.75	6.00	4.00
WASHINGTON																	
Aberdeen	.85	1.00	Cash disc.	25	.85	14.00	.....	.....	.70	.....	.....	....	6.50	6.00	.....	.....	.....
Clarkston	1.00	1.00	No disc.	25	.70	12.00	1.00	1.00	1.00	1.00	12.00	1.00	.....	.....	.....	12.00	10.00
Longview	.80	.90	Cash disc.	25	.80	10.00	1.00	.80	.75	.65	10.00	.65	.....	.....	.....	.....	.....
Tacoma	.70	.80	5%	25	.55	10.00	.80	.70	.70	.45	6.00	.55	5.00	5.50	5.00	.....	4.25
Vancouver	.80	.80	Cash disc.	25	.80	.....	.80	.70	.70	.42	.....	....	.....	.....	.....	.....	.....
Yakima	.80	.80	No disc.	25	.70	7.00	.60	.60	.60	.60	6.50	.35	5.50	7.00	5.15	7.50	5.00
WEST VIRGINIA																	
Beckley	.75	.80	Cash disc.	12½	.65	11.00	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	.....
Bluefield	.60	.60	No disc.	25	.60	10.00	.60	.60	.60	.50	8.00	.40	7.00	.....	.....	8.00	6.00
Charleston	.70	.70	No disc.	25	.60	10.00	.60	.60	.60	.50	10.00	.50	6.66	9.00	.....	10.00	7.00
Huntington	.70	.70	5%	12½	.55	9.00	.60	.60	.50	.45	.....	....	6.00	9.00	.....	.....	5.00
Montgomery	.....	.....	.....	..	.60	7.50	.80	.80	.80	.60	16.00	....	7.33	.....	.....	.....	6.00
Ronson	.60	.60	Cash disc.	10	.50	7.00	.56	.56	.55	.45	7.00	....	4.50	.....	5.00	7.00	5.00
WISCONSIN																	
Appleton	.50	.60	No disc.	25	.45	.....	.60	.50	.40	.....	.....	....	4.00	5.00	.....	.....	.....
Ashland	.50	.50	No disc.	50	.45	7.00	.80	.50	.40	.40	6.00	.45	6.00	6.25	.....	6.00	5.00
Fond du Lac	.....	.....	.....	..	....	.....	.52	.50	.50	.50	10.00	.40	4.00	.....	4.25	.....	.....
Green Bay	.60	.60	No disc.	25	.50	5.00	.60	.50	.50	.50	4.00	.20	4.00	6.00	4.50	10.00	4.00
Manitowoc	.60	.70	No disc.	25	.50	8.00	.80	.60	.50	.40	5.00	.50	5.00	.....	.....	8.00	.....
Milwaukee	.70	.70	None	25	.60	10.00	....	.....	.50	.....	.....	....	5.00	5.40	.....	.....	.....
New Lisbon	.60	.60	No disc.	25	.50	.....	.60	.60	.60	.50	.....	....	5.00	3.70	.....	.....	8.00
Sheboygan	.72	.72	Cash disc.	25	.64	9.00	.60	.60	.60	.50	8.50	.60	7.00	8.50	.....	10.00	.....
Waukesha	.70	.70	No disc.	25	.60	8.00	.60	.60	.60	.60	.....	.60	.....	.....	.....	.....	.....
Wausau	.60	.60	Cash disc.	25	.40	5.00	.60	.50	.50	.50	5.00	.40	.....	12.00	.....	10.00	.....
WYOMING																	
Casper	.60	.80	No disc.	25	.50	8.00	.80	.70	.60	.50	8.00	....	8.00	6.00	.....	6.00	.....
Cheyenne	.70	.70	No disc.	25	.60	12.00	.80	.70	.50	.50	7.00	....	6.80	.....	7.00	10.00	5.00
Laramie	.90	.90	No disc.	25	.70	10.00	.90	.90	.90	.....	10.00	.70	....	5.00	.....	.....	.....
Sheridan	.85	.90	Cash disc.	25	.65	.....	.80	.70	.60	.45	6.00	.60	6.00	7.50	7.50	.....	.....
CANADA																	
Montreal	.60	.60	No disc.	25	.40	6.00	.40	.40	.40	.40	5.00	.40	.....	5.00	.....	.....	.....
Ottawa	.50	.60	.....	25	.40	6.00	.60	.60	.60	.....	.....	.30	4.50	.....	.....	.....	.....
Toronto	.60	.60	Cash disc.	25	.40	6.00	.60	.60	.60	.40	7.00	.50	5.00	5.50	5.00	6.50	3.50
Vancouver	.90	1.00	No disc.	50	.60	7.00	.80	.60	.60	.35	7.00	.35	.....	5.50	.....	.....	5.00

Table I shows the average price of ice per 100 lbs and per ton in each state in the four divisions into which the country has been divided.

TABLE I—AVERAGE PRICE OF ICE PER 100 LBS. AND PER TON IN STATES BY GROUPS, 1950

State	Dom. Trade 100 lbs.	Light Commercial 100 lbs.	Heavy Commercial 100 lbs.	Dealers Per Ton	Car Icing Per Ton	Carload Per Ton
EASTERN STATES—67 REPORTS						
Connecticut	69.4c	56.2c	$9.67	$4.92	$8.00	....
Delaware	63.5c	55.0c	9.00	6.00	7.25	$4.00
D. C.	77.5c	65.0c	8.00	5.34	8.00	....
Maine	67.5c	46.7c	6.75	4.83	6.50	5.00
Maryland	60.0c	50.0c	8.42	5.17	....	5.00
Massachusetts	74.1c	56.9c	6.42	4.58	7.33	....
New Hampshire	73.3c	55.0c	8.00	5.50	7.00	....
New Jersey	78.3c	66.7c	10.33	7.29	6.69	5.25
New York	69.3c	59.7c	8.40	5.51	8.31	5.27
Pennsylvania	67.8c	52.9c	7.40	5.58	6.57	5.00
Rhode Island	67.5c	50.0c	8.00	4.33	8.00	....
Vermont	70.0c	60.0c	8.00	6.50	....	....
Virginia	65.7c	56.6c	7.33	6.27	6.05	5.00
West Virginia	67.5c	58.3c	9.08	6.29	7.77	5.80
AVERAGE PRICE	69.4c	56.4c	8.20	5.58	7.29	5.04
SOUTHERN STATES—70 REPORTS						
Alabama	61.7c	51.7c	$8.00	$5.90	$6.00	$5.50
Arkansas	63.3c	54.6c	10.00	6.80	....	....
Florida	69.0c	58.0c	8.50	6.80	....	....
Georgia	58.9c	52.0c	8.71	6.40	6.55	5.00
Louisiana	55.0c	46.0c	8.20	5.75	6.70	5.17
Mississippi	64.0c	52.8c	8.67	6.50	8.25	....
North Carolina	59.3c	54.2c	8.57	6.17	8.50	5.00
Oklahoma	72.4c	61.0c	10.17	7.21	6.97	5.25
South Carolina	59.0c	49.8c	8.46	6.59	6.79	5.00
Tennessee	60.0c	56.6c	8.66	6.00	8.00	6.50
Texas	61.7c	56.9c	8.83	6.24	5.94	5.83
AVERAGE PRICE	62.2c	54.0c	8.80	6.40	7.08	5.41
MIDWESTERN STATES—75 REPORTS						
Illinois	65.4c	57.1c	$9.80	$5.79	$6.28	$4.69
Indiana	68.1c	56.4c	8.17	5.78	7.37	4.83
Iowa	65.0c	54.3c	8.43	5.93	6.56	5.12
Kansas	64.9c	57.1c	8.94	6.29	5.94	5.29
Kentucky	63.8c	53.8c	9.50	5.50	8.17	3.90
Michigan	67.1c	60.1c	9.86	6.33	8.17	....
Minnesota	74.6c	62.5c	10.20	5.16	5.83	4.50
Missouri	63.7c	53.5c	9.42	6.42	5.50	4.73
Ohio	69.3c	58.3c	8.80	5.85	8.12	....
Wisconsin	62.4c	51.6c	7.43	5.00	....	....
AVERAGE PRICE	66.4c	56.5c	9.05	5.80	6.88	4.72
WESTERN STATES—58 REPORTS						
Arizona	77.0c	67.5c	$8.75	$10.00	$5.83	$5.00
California	78.4c	60.0c	8.65	7.58	4.63	3.50
Colorado	76.3c	62.0c	9.00	7.30	5.52	4.80
Idaho	80.8c	76.7c	9.67	6.50	4.78	4.00
Montana	78.0c	62.0c	8.00	6.17	6.50	5.50
Nebraska	60.0c	50.0c	8.00	5.00	5.50	4.00
Nevada	107.0c	100.0c	8.00	....	....	4.50
New Mexico	75.0c	70.0c	11.00	10.00	5.50	5.00
North Dakota	75.0c	65.0c	7.00	5.00	4.75	5.50
Oregon	96.2c	80.0c	10.12	7.17	7.50	5.67
South Dakota	83.0c	71.0c	9.60	6.00	6.75	4.50
Utah	66.2c	45.0c	7.60	5.00	....	4.25
Washington	85.4c	73.3c	10.60	5.67	5.73	6.42
Wyoming	79.4c	61.2c	10.00	6.93	6.60	5.00
AVERAGE PRICE	79.8c	67.4c	9.00	6.79	5.80	4.83

Table II presents summaries of the prices compiled in Table I for ice sold at retail, both for the domestic and commercial trade.

TABLE II—SUMMARY OF ICE PRICES PER HUNDRED POUNDS AND PER TON—1950

Section	Domestic Trade 100 lbs.	Light Commercial 100 lbs.	Heavy Commercial per ton
Eastern States	69.4c	56.4c	$8.20
Southern States	62.2c	54.0c	8.80
Midwestern States	66.4c	56.5c	9.05
Western States	79.8c	67.4c	9.00
GENERAL AVERAGE	69.4c	58.6c	8.76

Table III presents summaries of the prices compiled in Table I for wholesale ice in each class of trade in the four sections, also the general average.

TABLE III—AVERAGE PRICE PER TON FOR DEALERS CAR ICING, CARLOADS

Section	Dealer Sales Per Ton	Car Icing Per Ton	Carload Sales Per Ton
Eastern States	$5.58	$7.29	$5.04
Southern States	6.40	7.08	5.41
Midwestern States	5.80	6.88	4.72
Western States	6.79	5.80	4.83
GENERAL AVERAGE	6.14	6.76	5.00

Table IV shows the average prices charged for the different classes of trade during the last seven years. These prices are illustrated in graphic form in the chart reproduced in the first part of this article.

TABLE IV—AVERAGE PRICES CHARGED FOR ICE, VARIOUS CLASSES OF TRADE, 1944–1950

	1944	1945	1946	1947	1948	1949	1950
Domestic	57.5c	58.9c	59.4c	64.5c	67.2c	68.5c	69.4c
Commercial	41.5c	42.4c	41.5c	47.0c	50.6c	51.3c	51.2c
Dealers	$5.50	$5.56	$5.72	$6.13	$6.04	$6.41	$6.14
Car Icing	4.92	5.17	5.45	5.77	6.68	6.73	6.76
Carloads	4.24	4.28	4.61	4.70	4.92	5.17	5.00

Table V gives the average price for domestic trade in different sections of the country for 1940-1950 inclusive. These figures show only slight increases during the last ten years.

TABLE V—AVERAGE PRICES FOR DOMESTIC TRADE IN DIFFERENT SECTIONS—1940–1950

Year	Eastern	Southern	Midwestern	Western
1940	52.0c	48.3c	50.9c	64.1c
1941	53.1c	45.6c	50.9c	65.0c
1942	55.9c	50.6c	53.9c	66.5c
1943	57.2c	52.3c	55.0c	66.0c
1944	58.5c	52.4c	55.8c	63.8c
1945	57.5c	52.1c	56.1c	69.7c
1946	59.4c	52.2c	56.5c	69.4c
1947	63.3c	59.3c	60.8c	74.5c
1948	66.9c	60.3c	65.0c	76.6c
1949	67.2c	62.2c	66.7c	77.8c
1950	69.4c	62.2c	66.4c	79.8c

Table VI shows the average price received for domestic ice, wholesale ice, and all ice sold. The grand average for all ice as shown in this table is $8.71 per ton as compared with $8.73 per ton last year and $8.55 the year before.

TABLE VI—AVERAGE PRICE OF ICE—1950

	Per Cwt.	Per Ton
AVERAGE PRICE RECEIVED FOR DELIVERED ICE—1950		
Domestic Trade	69.4c	$13.88
Light Commercial Trade	58.6c	11.72
Heavy Commercial Trade	43.8c	8.76
GENERAL AVERAGE	57.3c	$11.45
AVERAGE PRICE RECEIVED FOR WHOLESALE ICE—1950		
Dealers		$ 6.14
Car Icing		6.76
Carload Ice		5.00
GENERAL AVERAGE		$ 5.97
AVERAGE PRICE RECEIVED FOR ALL ICE SOLD—1950		
Delivered Ice		$11.45
Wholesale		5.97
GRAND AVERAGE ALL ICE SOLD		$ 8.71

Table VII shows the range in price for the different classes of trade in various sections. As usual these prices show considerable variation in all sections due to local conditions. This variation however appears to show a wider spread than in previous years.

TABLE VII—RANGE OF PRICES OF DIFFERENT CLASSES OF TRADE IN VARIOUS SECTIONS

	High	Low	Diff.	High	Low	Diff.
	EASTERN			SOUTHERN		
Domestic Trade	78.3c	60.0c	18.3c	72.4c	55.0c	17.4c
Light Commercial	66.7c	46.7c	20.0c	58.0c	46.0c	12.0c
Heavy Commercial	$10.33	$6.42	$3.91	$10.17	$8.00	$2.17
Dealers	7.29	4.33	2.96	7.21	5.75	1.46
Car Icing	8.31	6.05	2.26	8.50	5.94	2.56
Carload	5.80	4.00	1.80	6.50	5.00	1.50
	MIDWESTERN			WESTERN		
Domestic Trade	69.3c	52.4c	16.9c	107.0c	60.0c	47.0c
Light Commercial	62.5c	51.6c	10.9c	100.0c	45.0c	55.0c
Heavy Commercial	$10.20	$8.17	$2.03	$11.00	$7.60	$3.40
Dealers	6.42	5.00	1.42	10.00	5.00	5.00
Car Icing	8.17	5.50	2.67	6.75	4.63	3.12
Carload	5.29	3.90	1.39	6.42	3.50	2.92

In the tables showing the reports from the various cities, Canadian prices are included but they are not included in the above analysis. Prices reported from these Canadian points are somewhat higher than last year.

The Ice Industry

National Association of Ice Industries

Executive Offices
1706 L St. N. W., Washington 6, D. C.

PRESIDENT
H. O. McLain, Chicago, Ill.

EXECUTIVE SECRETARY
Mount Taylor, Washington, D. C.

President's Reorganization Plans Threaten Independent Wage Hour Administration

IN ACCORDANCE with the Reorganization Act of 1949, President Truman has submitted twenty-one (21) reorganization plans to the Congress. Ostensibly, they are designed to streamline the government in the interest of greater efficiency and economy. Moreover, they purport to carry out the recommendations developed through careful research and study conducted by the Commission on Organization of the Executive Branch of the government, headed by former President Herbert Hoover.

A bulletin issued recently by the National Association of Ice Industries states that an analysis of two of the plans show that they go far beyond the recommendations contained in the Hoover report. These two plans are explained in relation to their effect upon the ice industry.

Reorganization Plan No. 6

This plan proposes to destroy the independent status of the office of Administrator of the Wage and Hour Division, created when the Fair Labor Standards Act was first passed in 1938 by transferring all administrative and enforcement authority of the Wage-Hour Law to the Secretary of Labor, thereby subjecting the Administrator to the complete direction and control of the Secretary.

This is the third attempt by the present administration in four years to place the Wage-Hour administration in the hands of the Secretary of Labor. In 1947, the President's Reorganization Plan No. 2 sought to achieve this objective. Again in 1949, the Lesinski Wage-Hour Bill contained a provision that would have accomplished the same result.

If the change is made, complete responsibility for interpreting, administering and enforcing the Wage-Hour Law would be placed in the hand of an executive officer, the Secretary of Labor. This officer has as his basic legal duty the fostering and promotion of the interests of one group of regulated persons, namely, employees. Rumors have it that if this plan is accepted an assistant Secretary of Labor, a CIO appointee, will be assigned the job of administering the Wage-Hour Law.

Reorganization Plan No. 12

This plan proposes to place the office of the General Counsel of the National Labor Relations Board under the control of the board. It would restore unified authority and responsibility in the NLRB, or its chairman thereof, for the investigation, prosecution and adjudication of all NLRB cases (Taft-Hartley), as was the case under the old Wagner Act. In short, it would make of the board, the prosecutor, jury and judge of all labor relation problems and controversies coming within the purview of the Taft-Hartley Law and before the board for settlement.

In other words, there would be no separations of powers or functions between the board and the General Counsel. On two separate occasions, the special joint Congressional committee has found and announced publicly that the present separation of functions has served to promote public confidence in NLRB proceedings.

Experience under the Wagner Act proved that employers did not receive fair and equitable consideration. The old NLRB had only one client, namely, employees. Should plan No. 12 now before Congress be approved, all evils existing under the Wagner Act would be revived.

Personal Action Needed

Those who are in favor of maintaining the existing independent status of the present Wage-Hour Division are advised that now is the time to express their viewpoint to their members of Congress. In so doing they should register their protest against Reorganization Plan No. 6. Likewise, if they are in favor of maintaining the present independent status of the General Counsel's office in the NLRB, they should express their viewpoint to their members in Congress by registering their protest against Reorganization Plan No. 12.

For most ice companies Plan No. 6 is perhaps of greater interest than Plan No. 12. This is due to the greater applicability of the Wage-Hour Law to their operations than of the Taft-Hartley Act. However, even in the case of the latter and in the interest of good government, if for no other reason, they now have the opportunity and the responsibility of expressing their views regarding both.

Under existing legislative procedure, the above two plans plus the remaining 19 (not commented upon herein) must be rejected by at least one branch of the Congress within 60 days from March 13. Either of them can be called up by the chair for vote following committee action. Their rejection requires a constitutional majority vote, not a majority of those present and voting on the day the final vote is taken. (A constitutional majority means 218 votes in the House and 59 votes in the Senate). Due to the absence of so many members, now engaged in their campaigns back home, this becomes an important factor in the ultimate outcome of these plans.

Miss Ice Centennial of 1950 Appears In Picture Magazine

IN THE Letters to the Editor column of Life magazine on March 20 a face familiar to ice men was seen. It was a picture of Helen Hagen who made an appearance at the National ice convention in New York as Miss Ice Centennial.

Just in case some readers of ICE AND REFRIGERATION are not familiar with Miss Hagen's face, her picture is reproduced here with ice props.

Quick to seize a promotional opportunity the N.A.I.I. publicity director noted an article about industry "queens" in the February 27 issue which cited many "phonies" employed strictly for publicity purposes. The following letter was dispatched to the Life editor with a picture of Miss Hagen, mentioning the fact that the Ice Queen was shown with props—Ice—along with a cheesecake pose.

"Sirs:

"There are a great many legitimate 'Sweethearts' in addition to the phonies you exposed. Here is a picture of the icemen's sweetheart, Miss Helen Hagen—Miss Ice Centennial. Chosen by the ice industries of America, she is helping us celebrate the 100th Anniversary of the invention of the first American ice-making machine this year."

—FRANCIS X. TIMMONS

A week after this letter appeared in Life an international news syndicate—E.P.S. News Syndicate—requested a story and more pictures of the Ice Queen. E.P.S. supplies features to 16 prominent foreign countries and entertainment publications in Hollywood and Chicago.

Another crowning achievement—a letter from the chairman of the Minneapolis Aquatennial Association—was accomplished when she was invited to be the special guest of the 1950 Aquatennial. Visiting queens will participate in a full week of luncheons, banquets and various Aquatennial events. Typical highlights of the week—July 21 to July 30—are the Saturday afternoon parade, an evening parade, a spectacle of beautifully lighted floats, and the coronation of the new Queen of the Lakes. It is estimated that nearly a million people see the two parades.

From letters received by the Publicity Department since publication of the letter, it is evident that thousands of people read the Letters to the Editor columns. Requests were even received for pictures for pin-up purposes from college boys!

National Exchange for Successful Merchandising Plans

A PLAN is being developed by the Personnel Training and Marketing Department of the National Association of Ice Industries to provide a national exchange of good merchandising and personnel administration plans—ideas that have been used profitably by ice companies. The project is explained in letters to National Ice Marketing Institute graduates, unit association secretaries and merchandising forum chairmen.

Accompanying the letters is a list of activities that have been used successfully by many ice companies. Request is made for names of concerns which have used one or more of these activities to increase their business. The list of activities are as follows:

List of Activities

Domestic refrigerator sales and rental
Vegetable display case sales and rental
Beverage chest sales and rental
Picnic chest sales and rental
Water cooler sales and rental
Other commercial equipment sales
Selling ice vegetable method
Packaged ice sales: cubes, sized, crushed, block
Unpackaged ice sales: cubes, sized, crushed, block
Operation of vending equipment
"Party Ice" service to mechanical owners
Poultry icing (retail level)
Fish icing (retail level)
Icing fresh meat displays
Vegetable or fruit icing at point of harvest
Milk icing in retail distribution
Hotel, restaurant and tavern ice sales
Combatting "automatic" ice machines
Bottled beverage icing
Truck icing
Industrial uses of ice for poultry, fish, sausage, bakeries, others.
Screening and careful employee selection
Sales training
Contest operation
Incentive compensation

The information obtained from these reports will be compiled and issued through a series of bulletins, telling about how such plans are operated in various parts of the United States and Canada.

Centennial Publicity Kit Available

AN ICE Centenial publicity "kit" has been made available to its companies by the Publicity Department of the National Association of Ice Industries. The kit, which can either be incorporated into a local newspaper advertisement or submitted to editors as a relase, includes two pictures and a mimeographed account of how the machine was invented by Dr. John Gorrie of Florida. One of the pictures shows the statue of Dr. Gorrie which stands in the U. S. Capitol in Washington; the other depicts the model of his original machine on display in the Smithsonian Institution.

In building an ad around the kit, ice companies are advised to tie in the Centennial observance with the number of years they have served their individual communities. Proposed as a headline is "100th Anniversary of the Ice Industry . . . 26th Year of Service for the Blank Ice Company." Announcement of open house at the ice plant is suggested as another possible tie-in feature.

Point-of-Sale Advertising Material Now Ready To Sell Ice

BROCHURE on local point-of-sale ice advertising and merchandising material has been developed by the Personnel Training and Marketing Department of the National Association of Ice Industries. Its purpose is to provide ice companies with material for distribution to commercial customers and others for creating public consciousness of the superiority of genuine ice company ice. The various advertising pieces displayed are printed in full harmonizing color, providing a beautiful background for ice.

Four-color decalcomania insignia for distribution to commercial ice customers.

A four-color decalcomania insignia is provided for distribution to commercial ice-using customers for use on their windows, on vegetable display cases, reach-in refrigerators and trucks.

A two-color folder—What is genuine ice company ice?—provides a direct follow-up to all ice company advertising. These are designed to be made available to the public wherever ice is sold, near vegetable displays, near the cash register in restaurants and they can also be used as envelope stuffers and passed out in such gatherings as cooking schools.

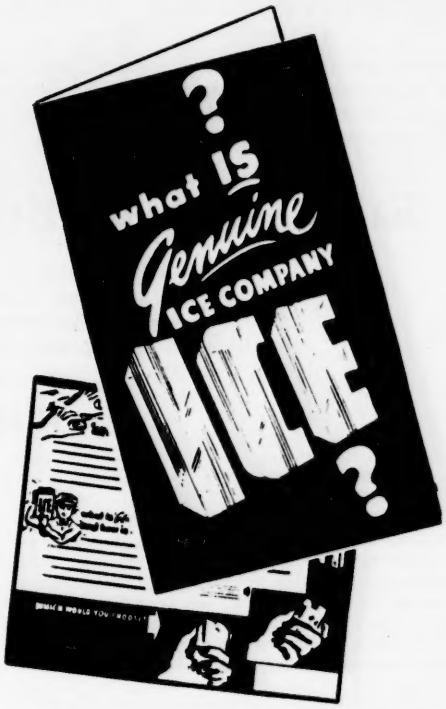
A set of eight four-color menu clip-ons is provided for restaurant operators to clip on their menus. Each of these feature a food or beverage service in which ice is used and carry a message about the advantages of using genuine ice company ice. These come eight on a perforated sheet.

A set of eight table and bar tents may be used for standing on tables and bars, augmenting the menu clip-ons. These pieces feature common bar beverages made with ice plus a few specialized drinks featured by the bar or tavern keeper occasionally. Space is provided for pricing the drinks. These pieces stand 3½x4 inches after folding.

Full-color restaurant menu covers are provided also for restaurant and other dining room operations which feature ice company ice in their table service. The inside pages are left blank for typing the menu. This is a real eye-catching sales piece for ice and makes an effective good will piece for restaurants and commercial ice customers. Size after folding is 7¾x9½ inches.

A set of colorful window streamers feature the use of ice in drinks and with foods. Produced in a handy 16x18 in. size, they are ideal for putting up as window displays in restaurants, food markets, drug stores, poultry and fish stores and fountain mirrors.

A five-piece hanging domination set is designed to do a spectacular job of building ice usage on vegetable, fish and poultry displays. They call customers' attention to ice advantages in relation to those displays. They are to be distributed to food market installations to be hung directly over display cases or in some other advantageous spot in the store.



Two-color folder designed to follow up all ice company advertising.

A large eye-catching banner advertising ice cubes for sale is designed for pasting on the windows of all retail stores that sell ice cubes. In such establishments as liquor stores and drug stores, ice cube sales can be built with the help of this banner.

Another large colorful banner has been created to draw people's attention to sized or "party" ice. It is expected to induce the buying of extra ice for special occasions and for entertainment. This banner is to be posted wherever there is an outlet for sized ice—on the platform, on delivery trucks, on windows of stores that resell ice.

Posters used to advertise sales contests among employees of "Big 10" group of ice companies. Left, the 100th Anniversary contest; center, the Summer Special contest; Right, the Sweepstakes contest. These posters printed in two colors on heavy cardboard measure 20x28 inches.

Sales Contests Bring Home the Bacon

As a result of the sales contest described below in 1949, 1136 ice-using appliances were sold by a middle west ice company. In 1950, with a considerably amplified program, and more prizes, the company expects to sell a minimum of 1500.

1136+1500=2636 New Ice Customers Within Two Years

FOLLOWING a successful sales contest last year, covering sales of refrigerators and other ice-using appliances, the "Big 10" group of Ice Companies, operating ice plants in Indiana, Ohio and Kentucky, plan a bigger campaign running throughout the first part of the year and the summer ice season of 1950. Last year 1136 ice appliances were sold. This year they expect to sell at least 1500.

Every sale for which employees receive credit will count in the contest. All-expense trips and cash prizes will be awarded the top winners. For others a list of merchandise prizes will be available from which they can make their own selections. Sales of equipment will include new domestic refrigerators, used and repossessed refrigerators, commercial refrigerators, ice chests, water coolers, vegetable display cases, picnic chests and ice cream freezers. All those connected with the "Big 10" group of ice companies is eligible to enter these contests except company managers and refrigerator salesmen and saleswomen.

Early Bird Contest

The Early Bird contest ran from January 1 to March 31. At this time of the year employees had more time to talk to their customers and prospects than during the busy summer months. Prizes were offered as follows:

First prize: All-expense trip to Detroit to see baseball game between the New York Yankees and Detroit Tigers.

Second prize: $25.00 in cash

Third prize: 1,500 merit points.

100th Anniversary Contest

The One Hundredth Anniversary contest runs from April 1 to June 30 for which five prizes will be offered.

First prize: $50.00 in cash

Second prize: $37.50 in cash

Third prize: $25.00 in cash

Fourth prize: 1,500 merit points

Fifth prize: 1,000 merit points

Summer Special Contest

The Summer Special contest runs from July 1 to September 30 for which four prizes are offered.

First prize: Four-day all-expense trip, including wife or husband, to Lexington, Ky., to visit famous horse farms and see University of Kentucky football game.

Second prize: $37.50 in cash

Third prize: $25.00 in cash

Fourth prize: 1,500 merit points

Sweepstakes Contest

The Sweepstakes contest covers the entire period from January 1 to September 30 for which five prizes are offered as follows:

First prize: Seven-day all-expense trip, including wife or husband, to New Orleans, including trip on Mississippi River.

Second prize: Seven-day all-expense trip, including wife or husband, to New Orleans, including trip on Mississippi River.

Third prize: $75.00 in cash

Fourth prize: $50.00 in cash

Fifth prize: $25.00 in cash

In all these contests cash prizes can be exchanged for merit points. Winners of the trip prizes who are unable to make the trip can exchange with cash prize winners in the same contest.

School Contest

In addition to contests among employees, students in the high schools and junior high schools of the cities and surrounding rural areas served by the ice plant will be given an opportunity to participate in a contest, in which prizes will be offered for the most complete list of recognized uses of manufactured ice. The circular announcing this contest suggests that students may be able to obtain information concerning the use of manufactured ice from the school and city library and at the office of the local ice company. Seven cash prizes will be awarded, ranging from $25.00 to $5.00. Although this is not expected to produce direct sales, it is planned as good institutional adverstising, since the students who participate will do a lot of thinking and talking along the line of ice refrigeration, and will carry some of the thinking home to their parents. This contest will close May 6.

Ice Keeps Green Vegetables Better Shown by Tests

THE iced method of displaying fresh vegetables has been made the subject of a study by the U. S. Department of Agriculture. Some members of the produce trade have insisted that such produce as green beans, lima beans, beets, cucumbers, eggplant, green onions, green peas, peppers, radishes and squash should not be placed in contact with ice. To find out whether or not there was any basis for this contention Project No. 52 under the Research and Marketing Act was inaugerated and tests were made to determine the effect of temperature and moisture on the vegetables listed above.

In this test products of uniform quality were displayed as follows: (1) on an iced display (2) on a dry rack with an ice garnish (3) on a dry rack where moisture was added by sprinkling and with night storage at 40 F and a relative humidity of about 88 percent (4) on a dry rack with no moisture added and no cooler storage for night holding.

The results of the study are highly favorable to the iced method of handling. The findings substantiate and further augment the data developed through the ice industry sponsored vitamin research program. Ice does an extremely effective job in protecting quality, as indicated in the following summary from the report:

"The commodities held on the ice bed rack were generally in good condition longer than they were on the other types of display racks. This was due to the temperature and moisture provided by the ice. The low temperature held diseases to a minimum, and the moisture kept the produce in a relatively turgid condition. None of the produce appeared to be injured by being held on ice and most of it appeared greatly benefited.

"The rack garnished with ice maintained lower temperatures during the day, but as the ice melted the temperature rose enough at night to allow the development of disease somewhat more than on the ice bed rack. Moisture usually resulted in the commodity gaining weight.

"The commodities held on the sprinkled rack during the day and at 40 F at night were in good condition longer than those on the dry rack. The moisture was readily absorbed and most produce gained in weight. The warmer temperature during the day favored more rapid development of disease and advanced the aging in many commodities.

"The commodities held on the dry rack remained in good condition only a relatively short time. The high temperature increased decay while the lack of moisture caused severe withering and aging.

"Commodities such as radishes, green onions, beets, beans and peas appeared to be benefited much more by the cool moist conditions than were eggplant, cucumbers, and squash during the four day holding period. Eggplant, however, was the only commodity tested that remained about the same on all four types of display racks."

The above quotation is from a preliminary summary of the project which was conducted by John C. Hansen and L. P. McCulloch for the Handling, Transportation, Storage and Market Diseases, Bureau of Plant Industry, Soils and Agricultural Engineering, U. S. Department of Agriculture, Beltsville, Md. This report has been issued as office Report 213, "Effect of Temperature and Moisture on the Shelf Life of Fresh Vegetables."

Containers for Fresh Fruits and Vegetables

A BULLETIN on containers in common use for fresh fruits and vegetables has been issued by the Production and Marketing Administration of the U. S. Department of Agriculture. It describes and illustrates the types or classes of containers in common use and comments on containers standardized by federal law. Other subjects covered are the importance of standardization, misbranding, proper filling, non-standardized containers and containers commonly used for fruit and vegetable containers.

The statement is made that the great diversity in the sizes and types of containers used for shipping fresh fruits and vegetables is coming to be more generally realized as search is made for possible ways of meeting the increasing costs of marketing these products and of improving the efficiency of the distributing processes. Some reduction in types and sizes of containers would seem to be possible.

Certain products may require special containers but for the great mass of perishables moving in all directions across the country by rail and motortruck, reduction in container costs, economical handling, fair competition, proper accounting, and informative market reporting are contingent upon the use of a minimum number of well-established merchandising units. The benefits accruing from the standardization of hampers, baskets, and barrels are generally recognized, and it is believed that the principle of simplification could be applied to other types of containers with results equally advantageous to all concerned. In this field, as in other lines of industry, simplification means reduction in waste through the elimination of unnecessary sizes, types, and dimensions of manufactured products.

Field Schools Continue—Teach Ice Men How to Sell

THE third field school conducted by the Personnel Training and Marketing Department of the National Association of Ice Industries was held at Menlo Park, Calif. Thirty executives of ice companies in northern California and Washington attended the one-week session, March 13 through March 18.

The following class officers were elected: A. L. Robertson, Union Ice Company, Hayward, president; Kenneth Melrose, Union Ice Company, Santa Cruz, vice president; William Hunter, National Ice & Coal Supply Co., Yuba City, secretary; and Ray Burgess Rainier Ice & Coal Supply Co. Seattle treasurer. James Reed City Ice Delivery Co., San Francisco, a runner-up in the vote for president, was unanimously elected "Class Poet and Historian."

The final luncheon was held at the Ramor Oaks Restaurant, Redwood City. Certificates were handed out by Jack Dawson. President Robertson read a telegram from Mount Taylor, Executive Secretary of NAII, congratulating the group on its record.

In addition to the five class officers named above, these men attended the school: George Bassmann, Yuba City; John J. Mullin, Sacramento; and Ace Briggs, Oakland—all of the National Ice & Cold Storage Company in those cities; Bob Barnes, Chico; Joe Vajretti, Los Banos; John Hansen, San Francisco; Wally Ehlers, Oakland; Bill Bettencourt Auburn; Harry Sackett, Lodi; Edward Stern. Walnut Creek; William Porter, Napa; Fred Perkins, Oroville; Robert Bailey, Jr., Pittsburg; Harvey Grimmett, Redding; Ted Rose, Richmond; Joseph Homen, San Jose; Vince Fisher, Stockton; J. E. Williams, Watsonville; and K. G. Peterson, Vallejo, all of The Union Ice Company; Robert B. Malone City Ice and Fuel Company, Modesto; Roy Mackenhausen, Peninsula Ice Company, San Mateo; Hayes Cutler, San Jose Ice Company, San Jose; Leonard Francis, Central Ice Delivery Company, Stockton; Andrew Ewen, Monterey Ice Delivery, Monterey; and Jack McGoldrick, Rainier Ice & Cold Storage Company, Seattle.

Fourth Field School

Swinging back eastward after two sessions on the west coast, the fourth field school was held in Monroe, La. the week of March 27-April 1. A room in the Virginia Hotel was used. The class of 20 executives from ice companies in Louisiana and Mississippi was the first to boast a feminine member. She was Mrs. Emma Lou Perkins of the Smith County Ice Co., Taylorsville, Miss. Mrs. Perkins

Graduation luncheon for the Monroe, La. field school class. The five class officers stand at rear.

was elected class secretary. Other officers named were: G. Thomas Frazer, Monroe Ice Delivery, Monroe, president; John B. Fudickar, Fudickar Ice Properties, Monroe, first vice-president; Ben S. Pace, Concordia Ice Co., Inc., Ferriday, La., second vice-president; and J. C. Safford, Gulf Public Service Co., Inc., Lafayette, La., treasurer.

The graduation luncheon was held Saturday, April 1, at the Virginia Hotel. Certificates were awarded by Robert Milling. Other guests included Mrs. Vaughan; Fred Fudickar of the Fudickar Ice Properties, Monroe; and Harry Frazer, Monroe Ice Delivery, Monroe.

Members of the Monroe class had a combined experience in the ice industry of 284 years. Those attending, in addition to the class officers given above, were: E. B. Arender, Delhi Ice & Fuel Co., Inc., Delhi; J. P. Barker, Rayville Ice & Fuel Co., Inc., Rayville; Arnell Belgard, Ice Service Delivery, Inc., Alexandria; Albert E. Chapman, Wisner Ice Co., Wisner; J. H. Clements, Jr., Gulf Public Service Co., Inc., Mansfield; T. G. Crutchfield, Catahoula Ice Co., Jonesville; W. H. Davis, Winnsboro Ice & Fuel Co., Inc., Winnsboro; A. N. Duke, Tallulah Ice & Distributing Co., Inc., Tallulah; K. P. Hanlin, City Ice Service, Inc., Shreveport; A. P. Hernandez, Hernandez Ice Co., Baton Rouge; J. Jenkins, Gulf Public Service Co., Inc., Natchitoches; X. T. Matthews, St. Joseph Ice & Fuel Co., St. Joseph; William Russell, Hazlehurst Ice & Fuel Co., Hazelhurst, Miss.; W. L. Tillman, Mangham Ice & Fuel Co., Inc., Mangham, Miss.; H. A. West, Lake Providence Ice & Coal Co., Lake Providence, Miss.

Los Angeles Ice Company Solicits Better Income Homes

THE wheels of a comprehensive advertising program directed to better income homes for the sale of auxiliary ice have been set in motion by ice companies of Los Angeles, Calif., according to "Ice Public Relations Today", issued by the Public Relations Department of the National Association of Ice Industries.

During the summer months, a booklet describing "exquisite social uses of ice" was mailed to almost 4,500 women listed in the Los Angeles 1949 Social Register. At the same time, special literature outlining the use of crushed, cubed and block ice was sent to caterers and restaurateurs.

The advertising program is somewhat unique in that the style of the accompanying literature tied-in nicely with the type of announcement women of the social register class would expect to receive. The person's name was handwritten on the announcement or "invitation" card, which read: "Mrs. John Doe . . . 'Exquisite Social Uses of Ice' is forwarded to you as a discriminating hostess. Crystal Clear ice cubes and crushed ice so desirable in your entertaining may now be secured in packages of varying quantities from your local ice company . . . Should you desire the address of the location closest to you . . . etc."

Another piece of literature was sent via direct mail to caterers along the same lines which made them aware of what the ice company was doing to further catering business, and to keep the caterer informed of potential sales.

Copies of the brochure sent to women were sent to restaurateurs with information showing the significance of the mailing. The excellent possibility that these women might call on restaurants for entertaining purposes was explained. Mention was made of the quality of Iceman's Ice . . . of the decorative features . . . and the appetite-appeal ice lends to food.

National Ice Profits Drop

NATIONAL Ice and Cold Storage Co. of California, San Francisco, reported for 1949 total revenues of $3,173,8740 and net profit $247,769 or approximately $23.41 a preferred share, with dividends in arrears. For 1948, the company reported total revenues of $3,345,663 and net profit of $303,041 or $28.62 a preferred share. Long term debt, represented by a bank loan of $2,700,000 negotiated in 1946, to redeem the entire outstanding bond issue was reduced in 1949 to $1,400,000 from $1,800,000.

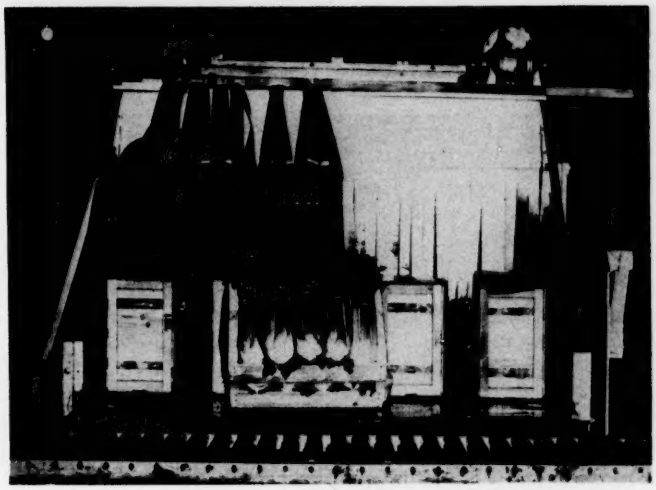
Vegetable Growers Recognize Value of Cooling with Ice Form Hydro-Coolers Association

INDICATING the extent to which the use of crushed ice has been accepted by growers for the cooling of vegetables, the Minnesota Hydro-Coolers Association was organized April 1 at a meeting of 65 market gardeners at Minneapolis Municipal Market. The association was set up as a cooperative with Sever Peterson, Eden Prairie, as chairman and Fred Gerten, St. Paul, secretary.

This is the first statewide organization of growers for growing and marketing of hydro-cooled vegetables, although large produce firms in the southwest and Pacific coast and other sections have been using the method. The association will set up standards of handling and processing commercially grown vegetables and complete marketing cooperation from grower to consumer.

Hydro-cooling consists of immediate removal of field heat from vegetables at harvest by a sharp reduction in temperatures through use of crushed ice. Temperatures then are held just above freezing through handling, distribution, wholesaling and retailing, with the retail store using special iced produce displays in presenting the produce to the consumer.

An experimental program of hydro-cooling was set up in that area last season with assistance of Winston and Newell Co., wholesale grocers. Thirty growers participated and moved several hundred thousand dollars' worth of locally grown produce under the hydro-cooling label.



Crates of celery receive ice water bath in vegetable packing plant.

The process is based on the fact that most vegetables have a high water content and are alive when harvested. Cooling them immediately maintains the high water content and stabilizes the condition of the vegetable in its prime to provide freshness and maintain appearance.

University of Minnesota farm experts have assisted with the program and will conduct special test plot checks this summer to determine varieties best adapted to the program.

Ice Keeps County Fair Displays Fresh

GARDEN produce, prepared foods and flowers exhibited at the Decatur County, Indiana, 4-H Fair August 3-5 were kept fresh and attractive for the fair's duration through the cooperation of the Greensburg Ice Company.

Working with the County Agent and the Home Demonstration Agent, Charles F. Scheidler of Greensburg Ice arranged to supply ice display cases for the Fair and to maintain ice beds in the cases. For the prepared foods display Mr. Scheidler furnished two false-bottom cases from his own stock; for the garden produce display three 6-foot cases were furnished by Trusty Manufacturers, Inc., of La Porte, Ind.

Prepared foods shown were mostly perishable items like custards, puddings, meat dishes, fresh fruit and vegetable dishes and high-protein casserole dishes. Since the two ice cases could not accommodate all the foods exhibited, an excellent opportunity to observe the benefits of ice preservation resulted. Mr. Scheidler reports that the dishes not on ice had to be removed within 24 hours, while the others remained in fine condition throughout the fair, with no evidence of spoilage. Similar conditions resulted in the flower exhibit.

Of the 42 garden produce exhibits, 16 were in the ice cases. Over the cases were posted a banner stating that they had been supplied by the Greensburg Ice Company and a sign, "Ice Keeps Our Vegetables Garden Fresh." A hand-printed sign over the flower exhibit expressed appreciation to Mr. Scheidler for his assistance.

Mr. Scheidler says he could not contact the boy and girl farmers early enough to help them protect their vegetables with ice from the time of harvesting to the time of judging. However he has supplied the County Agent with information about how this is being done.

Complimentary letters were received later from both the County Agent and the Home Demonstration Agent. Wrote the County Agent: "The vegetable display was improved 100 percent this year by using cracked ice. We wish to congratulate you for the ideas and thank you for your great assistance in putting the program across.

American Ice Quarterly Report

SALES of the American Ice Company, New York City, during the first quarter of this year have run 17 percent or more under those of a year ago, but the net loss for the quarter will be pretty much in line with that of $62,740 for the corresponding period last year. This report was made by Peter A. Buehrman, president, at the annual meeting. The first quarter's business is seasonally small and usually shows a deficit. The company has given consideration to buying in the 17,747 shares of preferred stock still outstanding but conditions did not make an offer advisable at this time, according to Mr. Buehrman.

Ice Company Modernizes with G-E Equipment

THE Mountain Ice & Coal Co., Pueblo, Colo., one of the largest ice manufacturing plants in the Rocky Mountain area, recently completed a modernization program which included $35,000 of General Electric equipment. By standardizing entirely upon G-E motors and control, the firm expects to maintain its 24-hour schedule of operation.

Three G-E 125-hp synchronous motors direct-connected to 10x10 in. double cylindered vertical, single-acting York ammonia compressors installed in the Mountain Ice & Coal Co. plant, Pueblo, Colo.

The program centers around synchronous and induction motors to drive York compressors which replaced the old steam engine-drive compressors. Three synchronous motors are rated at 125 hp, 440 v, three phase, 60 cycle, 360 rpm. Each is direct-connected to a 10- x 10-in. double-cylindered vertical, single-acting York ammonia compressor, equipped with ⅓ and ⅔ manual capacity reduction bypass. An induction motor, with 1200-rpm rating, drives a 13- x 9-in. double-cylindered vertical, single-acting York ammonia booster compressor through a V-belt connection.

How an Ice Man Got Publicity

WHEN S. M. "Swanie" Udden purchased two ice plants, one at Flafurrias and the other in North Pleasanton, Tex., he was given much more newspaper publicity than such transactions usually rate. The news story ran 24-column inches under a banner headline reading, "Demand for 'Real' Ice Still High, Udden says," including his picture. It was the result of an interview with a staff reporter.

Mr. Udden's career was described from way back in the 20's when he first was employed by Central Power & Light Co., as superintendent of the company's ice plants. It quotes Mr. Udden's statement that local housewives and grocers have discovered that ice is a better preservative for fresh vegetables than mechanical refrigeration. This, of course, was excellent publicity for a man taking over a business in a new town.

This all did not just happen, however. Mr. Udden reports that the story appeared without any direct solicitation on his part. Apparently someone informed the newspaper of his purchase of the two ice plants. The local afternoon paper was in the habit of carrying feature stories about citizens who were locally prominent. Here is the tip-off on why he was included among these prominent citizens as explained by Ice Public Relations Today, issued by the Public Relations Department of the National Association of Ice Industries.

It seems that for many years he maintained cordial and personal relations with several executives on the Corpus Christi Times. Whenever the occasion arose, he gave his wholehearted support to community activities promoted by the newspaper. He admits that he made it a point to continue and merit the paper's friendship and he plans to develop this same close relationship with the newspapers of Falfurrias and North Pleasanton.

Commenting further, "Today" says that other ice men can take a lesson from the attitude of Mr. Udden. You don't just drop a news release on the City Editor's desk and walk off. That's the one sure way to channel the story into the waste basket. Good press relations take time, effort, patience and a willingness to cooperate.

Burlington Equips Suburban Coaches With Ice Cooling System

THE Burlington railroad has under way a program calling for the air conditioning of 65 of its all-steel suburban coaches, 23 of which have already been completed. In addition, 14 main line coaches are undergoing similar improvement for use in suburban service.

The cars are being equipped with ice activated cooling systems. Both the heating system, which consists of fin radiation and overhead heating coils, and the cooling system are thermostatically controlled.

Interior of air conditioned coach. From a cooling coil at each end of the car a duct is partitioned at the center so that each unit serves one-half the car. Exhaust is at the center of the car.

The cooling system of each car consists of two ice bunkers with a total capacity of 1,800 lbs., a sump, a strainer, and two motor driven water pumps, all located underneath the car. The pumps force ice water through the coils, one of which is located at each end of the car.

An overhead duct is used for air distribution. The duct is partitioned at the center of the car so that each overhead cooling or heating unit supplies conditioned air to one-half the length of the car. The exhaust is at the center of the car.

Source of power for the system is a diesel engine driven direct current generator in the end of one of the cars, one such car being used on each train. All cars of the train are coupled together with electric train lines.

Reports From Unit Ice Associations

New England Ice Association, Annual Convention

THE annual convention of the New England Ice Association was held at the Kenmore Hotel, Boston, March 22 and 23. It was a good convention but with only a fair attendance. Several exhibitors reported good business. The annual banquet, with good entertainment and a luncheon for the ladies provided for the lighter side of the meeting.

A merchandising council session and an engineering session were held, both of which were very productive. At the engineering session, it was suggested that the engineers in the association or those responsible for plant operation might like to get together for a full program at a later date, and this probably will be arranged.

Raymond Wilber, executive secretary made an extensive report on the activities of the association during the past eighteen months.

J. R. Stevens of the Ice Cooling Appliance Corp., Morrison, Ill. talked on sales and rentals of ice refrigerators. Refrigerators are being sold, he said, as shown by the fact thta the City Prolucts Corp sold or rented some 1600 refrigerators in a relatively short period in a portion of the company's Florida territory. During discussion of this talk, it was brought out that one of the New England Ice distributors has started a sales contest along the same line as the one described by a representative of the Ice Cooling Appliance Corp. at the National convention.

W. C. Glennon of Swift & Co. gave an address "A New Market for Mountains of Ice." New England is a major contributor to the poultry industry and this talk was of particular importance to all of the New England ice men. Mr. Glennon pointed out the greatly increased use of ice that will result from Swift & Co.'s program and urged all ice distributors to make crushed ice available and then get in touch with the poultry processor in their communities to make their services known.

A. B. Foley from the Office of Wage and Hour Administrator for New England presented a review of the Wage-Hour Law.

Otto Henry, Thermo Cuber Co., gave an interesting and instructive talk on vending machines, giving a good overall picture of the place of the vending machine in the ice industry. Certain sections of New England, he pointed out, are especially adaptable to this method of merchandising ice.

One of the interesting features of the convention was a demonstration of ice carving put on by the Boston Ice Co. On the stage were two completed carvings. On the carving table in the center was placed a large block of ice and this was hammered and chiseled into a beautiful swan, complete in all details. The Boston Ice Co. has made a specialty of such carvings and has furnished many of them for various events both indoors and outdoors.

Representing the National Association of Ice Industries, was C. P. Austin, director of the Research Department. Mr. Austin told of the value of research to the ice industry, pointing out that such research had paved the way for the use of ice for icing vegetables and other uses which have resulted in enormously increased ice sales all over the country.

Jarvis Hunt, Legislative Counsel for the Massachusetts Associated Industries gave a detailed outline of where business and industry are heading under the present administration and what some of this proposed legislation will do to business. Mr. Hunt said business men pay too little attention to these legislative problems while supporters of the welfare state, planned economy and government controlled business are always on hand to push their policies. He suggested that business men should make a special effort to take an active interest in legislative problems and other government activities.

One sad note at the convention was the death on March 19 of Henry McIntosh of the Needham Ice Co., Needham, Mass., one of the old-time members whose funeral was held on the opening day of the convention. Mr. McIntosh was an active member of the association for many years.

Officers and Directors

Officers and directors for the coming year were elected as follows:

President, Norman Vermette, Bristol, R. I.

Vice-presidents, Sam Stevens, Ralph Getchell, P. F. Hogan, Louis Richer, Walter Chaffee, Leon Whitman.

Treasurer, Oliver Hill, Framingham, Mass.

Secretary and assistant treasurer, Charles Larsen, Somerville, Mass.

Executive business director, Raymond T. Wilber, Boston, Mass.

Directors: Wayne Cutler, Holyoke, Mass.; Edward Kanney, Boston, Mass.; Ralph Getchell, Bangor, Me.; P. F. Hogan, Springfield, Mass.; Theodore Minard, Lebanon, N. H.; Thomas Cummings, Rockland, Me.

Illinois Managers Conference

INTERESTING and constructive managers conferences were held in Illinois during April at Centralia April 6 and at Champaign April 13. Management problems were discussed and information was exchanged to the mutual benefit of all. Much of the discussion related to declining sales and increasing expenses.

Thes conferences were entirely informal, discussing the problem of how to keep ice operations solvent in the face of diminishing sales and increasing expenses. This conditioning is current in most other industries, if not all. Possible exception is a few "bigs" like steel, automobiles, etc.

Obvious cures were suggested (1) increased sales and (2) reduced expenses. The way of sales increases, it was suggested, was by training personnel, by an aggressive merchandising program embodying the sale of ice using appliances and other related items that lend themselves to the plan, pushing the sale of ice in its varied forms, particularly in the field of prepared ice where the largest increase seems probable in the light of recent experience, consideration of installing coin operated venders thus making ice readily available at all hours, and at a location convenient to the customers and in such form as desired, advertising, and diversification.

As a means of reducing expenses, every expense account should be scanned, and unnecessary items, wasteful practices and needless expense eliminated. Many times these have been built up over a period of years and in the light of present conditions, may well be eliminated. In the plant, automatic controls, labor saving devices, anything that holds promise of reduction of manpower or time saving. In the distribution department the question is frequently brought up: Can we deliver ice at a profit?

Missouri Merchandising Forum

THE quarterly meeting of the Merchandising Forum of the Missouri Ice Manufacturers Association was held Tuesday, April 11, at the Missouri Hotel in Jefferson City, Mo.

Discussing rental plans on domestic and commercial refrigerators, Charles Bardol and J. A. Shuhardt of the City Products Corp., St. Louis, told of their company's operation with this plan for commercial refrigerators and L. A. Nickell, Jr., Columbia Ice & Storage Co., Columbia, told of his company's operation on domestic refrigerator rentals. This subject proved to be of great interest to all those present and there was considerable discussion.

Robert C. Miller of Swift & Co. presented his company's plan on the icing of poultry and showed the film "Every Day in the Year." This subject was also discussed at great length. Earl S. Cook of the Consumers Ice Co., Trenton, Mo., told of a meeting they had had with grocers and butchers at which this program of icing poultry was presented.

On the subject of vegetable icing sales promotion, J. R. Dean of Pure Ice Co., Cape Girardeau, Mo., told of the recent meeting they had had in his town where 126 grocers were present. They had a combination vegetable icing and poultry icing demonstration. D. F. Govro of Perryville Ice Co., Perryville, Mo., stated that they had taken some of their grocers to this meeting and were very pleased with the results. B. A. Welscher, Home Ice & Fuel Co., Poplar Bluff, Mo., also said he had taken some of his grocers to this meeting, with very satisfactory results. David H. Cornish, Monroe City Ice Co., Monroe City, Mo., also told of the vegetable icing demonstration meeting held in Monroe City. Charles Bardol of City Products Corp. told of his company's experience in vegetable icing. There was quite a bit of discussion on this subject.

Experiences with vending stations were related by David H. Cornish, A. E. Frazier, Butler Ice & Cold Storage Co., Butler, Mo.; Alvin D. Hatten, Independence Ice & Creamery Co., Independence, Mo., and W. G. Cassmeyer, Merchants Ice and Coal Co., St. Louis.

Following adjournment of the meeting, many of those in attendance took a tour through the newly remodeled plant of the Capitol Products Co. conducted by J. F. Odam.

Gulf Coast Ice Association

THE annual meeting of the Gulf Coast Ice Association was held at the Admiral Semmes Hotel, Mobile, Ala., March 16. Officers were elected and a social and business program was presented. Included in the social program was a tour of the gardens around Mobile for the ladies. Late in the afternoon, the Mobile Ice Cmpany was host to members and their wives at an informal party. The annual banquet was held that evening.

One of the important events of the business program was a report by J. F. Kilbourn of Panama City, Fla. who spent some time in Washington lobbying against the new Wage-Hour legislation. Mr. Kilbourn discussed this subject as it applies to the ice industry and following his talk an open forum was held on the subject.

The following officers and directors were elected for the coming year: President, B. E. Faulkner, Dothan, Ala.; Vice president, Vester Gamble, Florala, Ala.; Treasurer, T. A. Broughton, Andalusia, Ala.; Secretary, B. E. Faulkner, Dothan, Ala.

Directors: Eugene Lokey, Panama City, Fla.; John T. Bauer, Mobile, Ala.; L. E. Johnson, Marianna, Fla.; and Louis Hill, Tallahassee, Fla., past president.

Kansas Association of Ice Industries Annual Meeting

THE Kansas Association of Ice Industries held its 32nd annual convention at the Allis Hotel, Wichita, March 27 and 28. It was a very successful convention. Although registration was a little below that of last year, there were many new ice men there who had not been present at previous conventions.

One of the highlights of the program was a talk by R. C. Miller of Swift & Co. Mr. Miller told the ice men of Kansas how Swift & Co. uses ice in the processing of poultry and of their program for promoting the sale of poultry displayed on ice. He pointed out that this will open the way for sales of huge amounts of processed ice.

C. M. Sandstrom, secretary-manager of the Kansas Food Dealers Association told how food stores use ice in the display of vegetables. In many stores, Mr. Sandstrom said, the groceryman does not use ice because he has not been sold on its use by the local ice man. In many towns, he said, grocerymen have difficulty in buying the kind of ice they need for this use. Mr. Sandstrom suggested that all ice men contact all grocers in their communities and let them know the kind of processed ice service that is available.

A considerable part of the meeting was devoted to the merchandising forum. The Kansas Merchandising Forum was formed a year ago and it has been proclaimed such a success that requests have come in from all parts of the state for zone meetings. Ice men who know what this merchandising council has accomplished realize its importance and this program reflected their interest in the subject.

New officers for 1950 were elected as follows: President, H. H. Bettis, Pratt, Kans.; Vice-president, George W. Hinds, Hutchinson, Kans.; Secretary-treasurer, C. A. Berkihiser, Manhattan, Kans.; Executive board: L. M. Gibson, Pittsburg, Kan.; T. E. Reiff, Newton, Kans.; Claude Daniels, Topeka, Kans.; G. A. Brewster, Chanute, Kans.; George Brown, Witchita, Kans.

Indiana Association of Ice Industries

THE driver-training-program sponsored by the Indiana Association of Ice Industries and directed by G. Elwood Hookey, Indiana University, was completed during April, with training schools at Newcastle, Hartford City, Portland, Connersville, Elkhart, Goshen, South Bend, Plymouth, Rochester, Michigan City and Gary. Mr. Hookey has now covered the entire state, bringing this training to 500 ice service men and approximately 75 percent of the association members. Another course will be developed for next fall and winter to review the principles set forth in the 1950 program and add additional information.

A state meeting of the Indiana Ice Merchandising Forum will be held at the Lincoln Hotel, Indianapolis, Wednesday, May 17 commencing at 10 a.m. A highly successful session on merchandising at the last Indiana convention indicated a vast amount of interest in the merchandising field. Advance registrations indicate a very good attendance.

Oklahoma Seeks New Secretary

FOLLOWING the resignation of Walter Hadley as executive secretary, the directors of the Oklahoma Association of Ice Industries met to consider appointment of a new executive secretary. Mr. Hadley resigned the post to take a position with an Oklahoma City ice concern. He had been with the Oklahoma association for many years.

The Practical Refrigerating Engineer
Reg. U. S. Patent Office

OPERATING • MAINTENANCE • NEWS
QUESTIONS AND ANSWERS

National Association Practical Refrigerating Engineers

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Executive Offices:
435 North Waller Ave.
Chicago 44, Ill.

Refrigeration for the Dairy and Ice Cream Industry

By Walter Kemper

Manager Borden Furnas Ice Cream Co., Indianapolis, Ind.

To perform the necessary function of making a profit, the management of an industrial plant must buy at the right places, sell the product, and maintain the machinery and equipment at its highest possible efficiency. Basis of efficient operation is design of the plant to meet production needs and selection of equipment that will do the job. This article discusses management's viewpoint of refrigeration in an ice cream plant, with special reference to the duties and responsibilities of the refrigeration engineer.

AT THE very outset, it must be thoroughly understood that the speaker is no refrigeration engineer, and in the particular we believe that is quite common to the vast majority of dairy plant managers. The basic function of a dairy plant manager, whether or not it is his own plant, under this capitalistic system of ours, is to make a profit, and that means that the manager must buy for one figure and sell for a high enough figure so that the difference between the cost and selling price is sufficient to pay all his operating expenses, depreciation, interest on the investment, make allowance for obsolescence of equipment, and make a profit for the stockholders.

It is immediately evident that to perform this function of making a profit, which is the reason for being in business that the manager must see to it that his purchasing department buys at the right prices, that sanitary conditions are maintained in his plants to conform with health standards, that he has an aggressive hard hitting sales force to sell his product and increase his sales volume, and he must have adequate maintenance of his dairy machinery, boilers and refrigeration, in addition to various personnel problems.

The manager must depend, then, upon his subordinates and key men to see that the various necessary functions of the plant are properly performed. The larger the dairy plant, the more time of the manager is spent for administrative purposes, and the more he must depend on his superintendents, maintenance men, and engineers to perform a satisfactory job.

The outline above will indicate to you that the speaker is in no sense a qualified refrigerating engineer, and that he, as a manager must depend upon others to first, provide and design, and secondly, to maintain an economically operated and dependable refrigerating system. Because you as refrigerating men, are interested basically in the refrigeration aspects, we shall confine the balance of our remarks to that phase of a managers' overall supervision.

Presented at the 40th National Convention, NAPRE.

Refrigeration Design Phase

Our first interest in the refrigeration application at any dairy or ice cream plant is when the plant itself is conceived. At that time, it is necessary for the dairy manager to advise his refrigerating design engineer the exact production which he feels the area in which that plant is located can absorb. This must be broken down in the case of a dairy plant to so many thousand pounds of milk per hour to be cooled either from a short time or long time pasteurizing unit, so many pounds of incoming milk to be cooled per hour and through a specified temperature range, the cooling of so many pounds per hour of various byproducts, such as buttermilk, chocolate milk, homogenized milk, coffee cream, whipping cream, cottage cheese and ice cream mix, and also, the refrigeration must be provided for the milk storage refrigerator to chill and keep cool the bottled milk.

In addition to this, it must be determined what source of water will be available for the plant. The first step is to investigate whether a suitable and satisfactory well can be installed. The next thing to investigate is city water, including its availability and cost, and the third would be either an evaporative condenser or a cooling tower to supply the water for the condenser needs of the refrigerating plant. Also, an investigation must be made regarding the local power company and their rates for current. There is always a relationship between the cost of current and cost of water to establish an economical operating balance, and various power companies have differ-

ent methods of billing. Some have high demand charges, which would dictate running the smallest possible motors for the greatest number of hours per day.

Equipment Selection

Once these factors have been established, it is necessary to select the specific type of dairy machinery that is to be used. In the past, a good many Baudelot type surface coolers were used for cooling pasteurized milk; however, the modern trend to high temperature short time pasteurization, indicates the use of plate type heat exchangers, and for this application the final cooling must be accomplished with a liquid coolant which, in most cases, is chilled water. If a plate type heat exchanger is to be used, the dairy machinery representative will provide a very specific design including the gallons per minute and temperature range of the chilled water which definitely fixes that refrigeration application.

Consideration must be given, then, to a schedule of the refrigerating loads to determine how many of the loads will occur simultaneously. With the use of short time pasteurization and plate type heat exchangers, it is generally conceded that a regenerator section should be used in the plate type heat exchanger and thus all incoming milk must be thoroughly chilled to provide sufficient cooling in the heat exchanger portion to cool the pasteurized milk. In most plants, the incoming milk from the farm is delivered over a relatively few hours during the operation period of the plant, and therefore, this incoming raw milk load occurs simultaneous with the pasteurized milk load. and the refrigerating plant must be set up to accomplish both cooling loads. Sometimes it is also necessary at the time incoming milk and pasteurized milk is being cooled to also cool by-products, but generally this can be scheduled for another time of the day.

One of the very interesting phases of refrigeration design engineering in dairy plants has been the trend to high temperature short time pasteurization, and the necessary simultaneous cooling of incoming milk and pasteurized milk. It is not uncommon that the incoming milk load is the equivalent of the pasteurized milk load, and many plants have found that when they change from long time pasteurization to short time pasteurization, that their refrigeration requirements were doubled.

This realization was at first a shock because double compressor capacity was indicated, and operating costs were higher because of higher demand charges and power; however, there was developed the ice builder type water cooling tank, which could be operated for 24 hours a day, and during the off peak loads, ice could be accumulated on the coils at the rate of 144 Btu per pound, and this ice could be dissipated and melted during the relatively short periods of very high refrigeration requirements. Thus, with this ice builder type water cooling tank many operators found that it was not necessary to increase their compressor capacity, but merely put the compressor to work for more hours per day, and where demand charges of power were a factor, this proved to be an economy in operation.

Ice Cream Plants

In the case of an ice cream plant, the dairy manager must first decide how much ice cream he expects to make in a peak day, week, and month. This is then broken down into how many gallons of ice cream must be made per hour, and from that the ice cream freezers can be selected. Generally speaking, for the purposes of breakdown protection. and also for multi-flavor bricks, it is expedient to use several ice cream freezers rather than one large one.

Once the peak ice cream capacity has been established for a peak day in hot summer weather, the hardening room should then be designed to hold a three day peak production. This is done to provide ample ice cream storage for holidays and Sundays when the plant would normally be inorperative and not producing ice cream. Once the rate of ice cream production is established per day, and the size of the hardening room settled, the refrigeration load can then be determined for the hardening room.

It is then the problem of the refrigeration design engineer to select a suitable evaporator to maintain the hardening room temperature. Normally, this temperature is maintained at -10 to -20 F., and so, whatever the type of evaporator used, there is the constant problem of defrosting.

For general purposes there are two types of evaporator suitable for hardening rooms, one, pipe coils, and two, blower units. Both types of evaporating surface have their advantages. In the case of the pipe coils, the initial expense is perhaps a little higher, but the defrosting is not a daily problem and in many plants the hardening room coils are only defrosted several times a year. In our own plants, we believe it should be done more frequently to obtain the best operating economy. The actual design of the coils can be either of the shelf type, where the cans or bricks are set in pipe shelves, or the overhead type of coil arrangement. The latter type is particularly well suited for large bulk storage, but the shelf type has definite advantages for the purposes of segregation of flavors, as well as maintaining a fresh inventory of product. We find coil type evaporators most effective when used with either an ammonia gravity float control or recirculating system.

The advantages of the blower type units (Figs. 1 and 2) for hardening rooms are that they provide a positive air motion in the hardening room which accelerates the hardening of the ice cream. Because of the velocity of the air across the coils, a smaller amount of coils is necessary; and in most cases, a lower head room can be maintained in the hardening room, thus effecting an initial investment saving in the insulated structure. The disadvantages of this type of unit are, first, for peak operating conditions they will require a daily defrosting; second, the air velocity in a sub-zero room is objectionable to operators, and there is a tendency to shut off the blower unit while the operator is in the room, and forget to turn it on when he leaves the room. Of course, the air unit is ineffective unless the fan is running; third, the difficulty of servicing mechanical parts such as fan, motor, circulator, in a sub-zero temperature.

Defrosting of the blower type unit is generally accomplished with water defrost, brine spray defrost, hot gas defrost, outside air defrost, occasionally, but rarely, with electric defrost, and in some instances, this defrost is accomplished by a combination of an anti-freeze solution that is sprayed over the coils and a concentrator or still, which constantly evaporates water from the solution to avoid the necessity of adding to the anti-freeze solution to maintain its low freezing point.

Summary of Requirements

In conclusion, the type evaporator for a hardening room is to a large extent determined by the size of a hardening room, the number of rooms, and local operating conditions. We all know that either pipe coils or blower units will perform a satisfactory job. The next consideration that must be given to a refrigeration application for an ice cream plant is, whether or not the plant is to produce novelties such as eskimo pies and

popsicles. For this application we must think in terms of a -30 F brine in order to get out production, and again the exact production that will be necessary for the particular plant must be determined beforehand.

Summarizing then, we have three main low temperature applications in an ice cream plant:

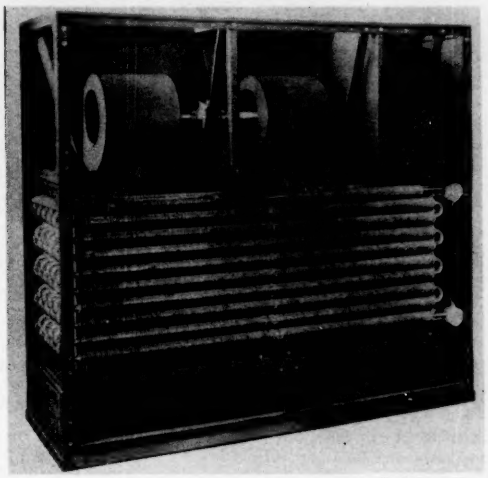
1.—The ice cream freezers, which will operate successfully at from 0 to 5 pounds gage ammonia pressure.

2.—Hardening rooms, which again will generally operate satisfactorily at about 0 pounds gage.

3.—But if a novelty or popsicle tank is used and a -30 degree brine is maintained, it is evident that the suction pressure less than 0 pounds must be maintained for successful operation and peak production.

In most large ice cream plants, there are also considerable high temperature loads that must be considered. If ice cream mix is made, it is also homogenized, and the homogenizer will establish the rate at which the ice cream mix must be cooled. The ice cream mix is a very viscous substance, particularly as it nears the freezing point, and ample cooling surface must be provided to successfully cool the mix; also, mix storage tanks must be provided for storing the mix and aging it. These tanks are normally of a holding variety and do not impose a heavy refrigerating load.

To summarize then, for the high temperature loads it is not unusual to have mix storage tanks to be held at approximately 32 degrees, and a mix cooler to cool the mix from pasteurizing temperature to 34 degrees Fahrenheit.



—York Corp. Photo

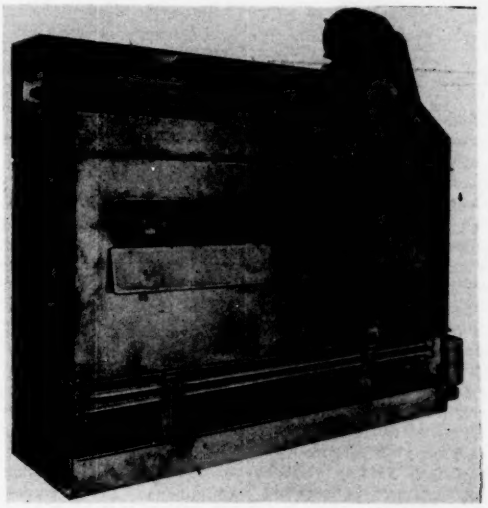
Fig. 1—Blower type cooling unit with cover partly removed. This dry coil type unit is floor mounted and requires regular defrosting of the finned pike surface.

Compressors

The selection of compressors for an ice cream plant will, in most cases, require at least two levels of suction pressures; one for the ice cream hardening rooms, and the ice cream freezers, which suction pressure should be in the neighborhood of 0 pounds, and the other suction pressure for the high temperature loads, which is mixed cooling and mixed storage, at approximately 35 pounds. If ice cream novelties or popsicles are to be made, it is then most desirable to add a booster ammonia compressor to provide the lower temperature levels that are required for this application.

There has been considerable experiment of late, and some successful installations, in the use of cooling tunnels for hardening of ice cream, mostly of the blast type. Also, special equipment has been constructed to freeze ice cream bricks in pint cartons through a conveyor and air blast assembly with a minimum of handling, such as the York Column Freezer.

Earlier in this paper we mentioned the fact that the usual procedure was to set up a hardening room for three days peak storage. It is not uncommon that after a plant is in operation for a number of years, the production and sales exceed by several times those originally anticipated, and because of building size or property limitations, it is not possible to add additional hardening room. this condition has, in a number of instances, been solved by the use of booster ammonia compressors for application on the hardening room evaporator, and by lowering the hardening room temperature, the hardening of the ice cream is accel-



—York Corp. Photo

Fig. 2—This spray type unit cooler has the access doors dropped to show the brine spray assembly. The bare pipe coils are also visible through the lower opening.

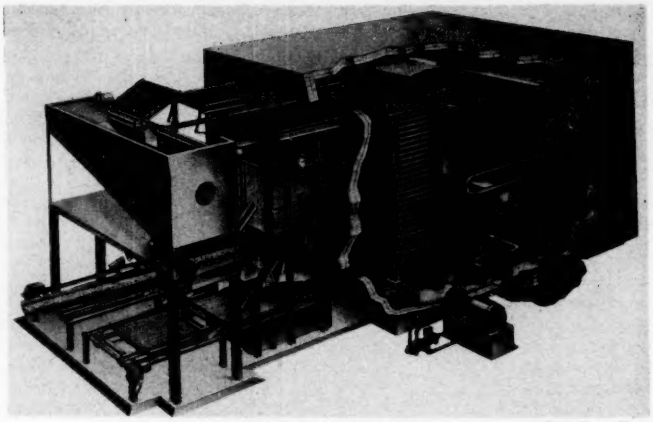
erated so that the ice cream that enters the hardening room late one evening is on the truck being delivered to the consumer the following morning.

In some ice cream plants, there is also the added low temperature refrigeration duty of precooling trucks to a sub-freezing temperature, by means of chilling holdover plates containing a eutectic solution to preserve the ice cream in a frozen state during the time the truck is delivering to the ultimate consumer.

Maintenance of Refrigerating Equipment

Once the refrigerating equipment has been designed and installed, its successful operation, its economical operation, and its dependable operation depend upon the operating engineer. The dairy manager must, of necessity, place complete responsibility for the successful operating of the plant upon the engineer.

The operating engineer is expected to diligently look after the refrigeration evaporators including those in the hardening room, and be diligent in the defrosting of hardening room evaporators. He must watch the operation of his plant closely, and particularly where booster compressors are used in extreme low temperatures, requiring a vacuum on the refrigeration suction side are encountered. The operator must constantly be on the alert for noncondensable gases in the refrigerating system and keep them purged to provide minimum operating costs and maximum refrigerating capacity.



—York Corp. Photo

Fig. 3—This type freezer has been installed in a Pennsylvania dairy to harden 465 gallons of ice cream per hour in pint packages. Each tray is filled with 154 pts. on a 2½ minute cycle and the hardening time is 1 hour and 15 minutes.

The operating engineer must likewise be constantly alert for any oil that might be carrying over from his compressors and entering his evaporators where the oil would provide an insulator and again increase the operating cost.

It is our experience that it is most desirable for the refrigerating operating engineer to maintain a day by day log of his operating conditions, including such items as cooler and hardening room temperatures, suction and discharge pressures, ammonia liquid temperatures, and water temperatures on and off the condenser. It is felt that the maintaining of such a log of operating conditions tends to make the operating engineer and management alert to any trend toward inefficient operation, or the indication that additional equipment is required.

The operating engineer is also expected to be a good housekeeper. The floors of the compressor room should be kept clean and swept, the compressor room equipment should be painted and kept free from dust. Specific care should be taken that any oil that might be spilled for any reason is immediately removed from the floor or machine parts.

Acknowledgement is made to our Chief Engineer, Carney Nickleson, and to E. N. Kerrigan, of Westerlin & Campbell Company, for assistance in the preparation of this paper.

Pyramid Prizes Pile Up

THE novel membership contest arranged to reward the industrious and the faithful this year is piling up the goods in quite a mound. Pardon us, we should have said "quite a pyramid." No one knows who will be the winner of these desirable prizes so it is impractical to assemble them in a pyramid to be photographed until the contest ends. If we could, it would be spectacular.

A number of the contributions by various chapters were recounted last month. Ray Burnett, Vice Chairman of the Membership reports additions. At the same time some of the chapters gave evidence of local pride which makes one think of the wind from Chicago or the hot air from . . . or maybe it is all justified.

Stockton-Modesto Chapter first offered a sack of dirt from nearby fields but realized that their unusually productive climate could not accompany the shipment to make the soil completely valuable. As a compromise they are contributing a case of Frozen Vegetables.

"From the Oil Capital of the Nation we will contribute 5 gallons of the best motor oil." That is the reply about Pyramid Prizes received from Tulsa. When Bill Reinhard reads that he will want to know whether the oil is coming from Houston, Texas or Whiting, Indiana. Possibly some people outside Tulsa do not know the location of the "Nation's Oil Capital." At any rate it is a good prize.

The contest this year has a clever angle in the double play on civic pride. It should be evident not alone in the operation of setting up the prizes. In addition it gives a drive toward winning. This is added to the promotional drive resulting from the value and desirability of the prizes which individual members can earn from the Pyramid.

Emblematic of its important sugar refining industry, New Orleans Chapter has donated a dozen five pound bags of superior quality sugar to the Pyramid. Many people thought all New Orleans sugar went into pecan Pralines. It seems like a very delightful way to use it too. This proves though, that they have a surplus for other uses.

Why go on like this about the prizes the successful members will earn in this contest. Probably many of the contestants already are putting much of their spare time on rounding up new members. We don't want to make the prize list so attractive that they neglect their families. Others may not have started to work yet.

Their attention is directed to a recent letter from President Emmett Quinn. He not only called attention to the valuable rewards which success in the contest will bring to the individuals, but he also emphasized the attractive trophy which the chapter can win by concerted effort.

N A P R E

Question Box

H. G. Venemann, Professor of Refrigeration, Purdue University and chairman of NAPRE Educational Committee, answers members operating problems monthly in this column. Send questions to Chairman H. G. Venemann c/o Purdue University, West Lafayette, Indiana.

Sub-floor for Cold Storage

Question No. 844: The expansion of our processing facilities makes it necessary for us to construct additional freezer storage space. For the floor construction we are thinking about putting in drain tile of the proper amount for ample drainage under our room. On top of the drain tile and fill we plan to use 8 in. of crushed limestone rolled level and tarred similar to a macadam road. Our insulation would be placed on top of this base and a 6 in. concrete floor placed on the insulation.

This substitution of macadam for a concrete sub-floor would save an appreciable amount of money on original cost. Have you any data on this type of construction as compared with concrete sub floors?—A.T.L.

ANSWER: This question is a little out of my line, but one of my colleagues in the civil school thought that the macadam construction would be quite adequate to sustain the load and satisfactory in other respects. He emphasized that precautions should be taken against crushing the tile. He suggested that concrete tile be used, as this would stand a greater shock when the stone was being rolled and a greater external pressure when in service. He suggested also that twelve inches of crushed limestone would be better than eight, especially if other than concrete tile were used.—H. G. Venemann

Protecting Underground Pipes

Question No. 846: We have a 5 in. cooling water line that is buried in soil which is frequently saturated by concentrated spray water drifting from our cooling tower. The underground section of this pipe, about 100 ft. long deteriorates rather rapidly. What is the best procedure to preserve short lines like this one? Under what conditions would anodic protection, as with magnesium, be practical on relatively short underground lines?—R.G.V.

ANSWER: Our service department at Purdue is responsible for the maintenance of many miles of underground pipe lines under many varying conditions of soil. The head man in this department did not advise any type of anodic protection but suggested one of the following.

His first choice was the use of cast iron pipe. He cited examples of cast iron pipe which had been in service since 1898 with little or no deterioration. Precoated pipe should stand up well in wet water. If you want to do the job yourself, first clean the pipe thoroughly, then apply a heavy coat of hot pitch, being careful to cover all of the pipe; wrap with 30 pound tar paper using number 14 copper wire; and pitch again. This should be done above ground before lowering the pipe into the trench, otherwise the workman cannot be trusted to get the pitch properly applied to the bottom of the pipe.—H.G.V.

Leak Location

Question No. 845: What would be the best method for locating ammonia leaks in a place where no fire could be permitted and no sulphur taper could be used?—E.I.G.

ANSWER: The question as stated gives us the option of using litmus paper or phenolphthalein paper. (See page 551 in *Principles of Refrigeration* by W. H. Motz). I understand, however, that the question as originally submitted excludes the use of regular ammonia test papers. It did not, however, state why they could not be used. In lieu of these or burning sulphur sticks I suggest the use of hydrochloric acid or strong muriatic acid. Either of these two liquids may be poured into a bowl and placed near the spot where the leak seems to come from. In the presence of ammonia the hydrochloric or muriatic acid will give off white fumes similar to those which are given off by the use of sulphur sticks. The acid could be applied to the pipe, flanges or threads by means of a sponge attached to the end of a stick.—H.G.V.

Oil Foaming

A SUPPLEMENTAL discussion of Question No. 843 has been furnished by Leon Buehler, Creamery Package Mfg. Co. to whom we are indebted for thoughtful discussion of other questions and problems in the past.—**H.G.V.**

Foaming of oil in the gauge glass on a refrigerant compressor crankcase is caused by the rather rapid release of gas from the body of the oil. This ordinarily happens on two different conditions:

Oil will hold refrigerant gases in solution and it holds more gas in solution at high pressure than at low pressure so that as the pressure is reduced gas will be released from the oil and cause foaming. This is very well illustrated in the draining of an ammonia oil trap, for example. The oil comes out as a froth or foam because of the reduction in pressure from that in the trap to atmospheric. When a compressor crankcase is rapidly pumped down exactly the same thing happens in the crankcase, and the oil not only foams in the gauge glass but also in the crankcase itself.

The second condition is when liquid refrigerant gets into the crankcase due to slopover. The liquid mixes with the oil and because the oil is relatively warm, the liquid boils violently and causes the oil to foam.

This foaming should do no permanent damage in the oil—that is to say, after the gas has been released. the oil itself will not have been changed. However, this foaming is not good while it lasts.

Foaming oil is the cause of severe oil pumping. On a compressor having an oil pump for force feed lubrication, the pump may become gas bound and fail to pump, or the quantity of oil circulated may be sharply reduced, thus interfering with proper lubrication.

Liquid slopover to the machine, particularly with ammonia, tends to wash the oil film off the cylinder wall so that these walls are no longer lubricated thus causing rapid ring wear and rapid cylinder and piston wear. Liquid slopover is of course undesirable for other reasons. It may actually be dangerous in that an excessive slopover could knock off a cylinder head, or break a piston or other part of the machine. The evaporated liquid getting back to the machine has done no work in the low side and yet is being pumped by the compressor resulting in a reduction in capacity and an increase of horsepower per ton. It is of course well recognized that slopover should be avoided by proper coil design, proper accumulator design, proper adjustment of controls.

Oil foaming in the crankcase can therefore be considered as bad, not only because of the direct results of the foaming itself but also because it is usually a sympton of undesirable liquid slopover.

NEW QUESTIONS

Answers in June Issue

Conversion to Flooded Operation

Question No. 847: We have a water defrost unit cooler in a freezer storage room. The unit is operated with top expansion of ammonia controlled by a thermostatic expansion valve. the coils are connected into horizontal headers across the top and bottom. Would it be possible to reconnect a unit of this type for flooded operation and get more capacity out of the unit?—C.R.D.

Stainless Steel Condenser Tubes

Question No. 848: Why are refrigerant condenser tubes not made of stainless steel? I realize they would be more costly, but at the same time the stainless steel tubes would be free from corrosion and roughness. Possibly scale and slime would not adhere so readily to their smooth surface. We would appreciate authoritative analysis in regard to using stainless steel tubes in condensers.—R.V.C.

Half Capacity Operation

Question No. 849: We have a 30 hp. condensing unit including V-belt drive and shell and tube condenser. Now it is desired to use this unit on a 15 hp. air conditioning job. The compressor speed can be reduced by changing the pulleys. Is there anything else we should do to get the best out of this unit at reduced capacity?—J.M.S.

News Notes and Activities of the Chapters

Rio Grande Valley

By Armin Doneis

WE HAD two good questions at our recent meetings which brought out a lot of comment and have been passed along to the National question box. One question was sent to us by Chauncey Stuntz who left the Valley last year and is now located in Charleston, S. C. He wrote that he watches Ice and Refrigeration very closely and reads the stories about Rio Grande Chapter with avid interest.

At the request of Educational Chairman John Muller, Secretary Doneis gave a report on the program of visual education films which has been arranged. He said that the full schedule of films had been established for all meetings through the end of the year. Two good films were shown at this meeting; "The Making and Shipping of Steel" being furnished by the United States Steel Corporation gave a good portrayal of the subject. The shorter film dealing with the historical development of the gyroscope was supplied by the Sperry Gyroscope Co.

Special speaker at the next meeting was Jake Mabe, Central Power and Light Co. His subjects were "Generation, Transmission, Distribution and Dispatching of Electrical Power." He gave a brief history of electrical power and gave some of the problems and difficulties connected with each phase of the work. Numerous questions indicated the interest his remarks had aroused, and he answered several questions relating to Power Factor and kvars also at the end of his talk.

President Woolrich reminded the meeting that the end of the chapter's fiscal year is approaching and that election of new officers would soon take place. He appointed the following members to the nominating committee: John Muller, A. M. Casberg and Armin Doneis. These members and others protested about placing present officers on this committee; this was considered highly irregular by some. To this President Woolrich explained that he was trying to be fair by balancing representation between the various industries and enterprises which support the chapter, and he hoped there would not be too much opposition as he could make no better choice under the circumstances.. This explanation threw a new light on the matter and the protests subsided.

Our members enjoyed the two films "Quality in the Making," describing the manufacture of ball bearings, and "Servicing Procedure for Ball Bearings" in which need for care and cleanliness was stressed. Films were supplied by New Departure.

The chapter voted to supply a hand tooled leather belt as its contribution to the membership contest Prize Pyramid as requested by the National membership committee.

Stockton-Modesto

By R. M. Edger

At our first meeting we welcomed three new members, Soden Fry, Charles Hill, Jr. and Roy Crozier. After our business session Mr. Schroeder ran some indicator cards on one of his Ball ice machines that had just been worked over. The card showed very good compression and a good discharge valve action.

Some of the members had never seen indicator cards made before so the process proved interesting to them. At a future meeting we plan to analyze the cards further and demonstrate their use in checking compressors.

At our meeting of April 3 held at Stockton, we had a very good program put on by the Pacific Gas & Electric Co., on electricity. H. W. Clingman of the company described power factor and how best and easiest to compute it. Then he turned the remainder of the program over to F. K. Fox of the General Electric Co., of San Francisco. Mr. Fox described how the new G. E. pyranol capacitors will cut the power costs on induction motors and how they have the ability to hold a more even line voltage on long leads off the transformers.

He quoted some savings to various industries here in the valley showing how the capacitors pay for themselves in a very short time and as they very seldom cause any trouble they go on working for years saving money for their owners.

We all learned a good deal from these two men about power and how best to save it.

Detroit

By Leon Adams

The annual open house or family night was held by Detroit Chapter on April 11 at Carl's Hall. Members brought their families and friends to enjoy the program of entertainment and sociability.

A very interesting and scenic travelogue opened the program. Produced by Northwest Airlines, it followed the route of the typical passenger leaving from Minneapolis and flying via Alaska, Japan, China and the Philippines on a trip to the Orient. Those interested in sports enjoyed especially the second film which showed the very enjoyable and productive fishing in Alaskan waters for King salmon and trout.

An added attraction arranged by George Baird was the choir of 16 mothers who are members of the P.T.A. of Isaac Crary School. Billed as the Crary Mothersingers, they demonstrated that their reputation gained by appearances in various parts of the state does not overrate them. Everyone enjoyed the good fellowship and entertainment at the affair. An excellent dinner was served to open the evening's program.

Fresno

By M. Pedersen

The meeting of March 27 was arranged as an inspection trip. The members of the chapter visited the plant of the Pacific Telephone and Telegraph Co. of Fresno. After the group had gathered, we were escorted through the building by Traffic Manager Hamilton who described the equipment and told how it operates.

Los Angeles

By Fred Herr

E. B. Utescher, supervising chief engineer of the Kirkeby chain of hotels, past-president of the NAPRE and current chairman of the Operating Data Book committee, was the guest of honor of Los Angeles Chapter, on the night of April 5 as the chapter staged one of its highly successful Refrigeration Quiz Night programs.

After a brief business session, Regis Gubser, chairman of the educational committee, turned the program over to Capt. Herbert Royden who had been named quizmaster. The chapter conducts these quiz sessions in the following manner:

A quizmaster is appointed who in turn selects a panel of experts who are expected to answer questions which have "stumped" the audience, or supplement answers from the floor with additional information.

The experts selected by Capt. Royden were Mr. Gubser, Frank Elliot, Rudi Kettler and George Paulick. Some of the questions which brought forth spirited discussion and the answers presented were as follows:

Question: In refrigeration plants at 50 to 100 tons capacity operating on a year-round factor of about 40 percent, how often and what methods of checking the output of the condenser pumps are recommended?

The answer, representing an amalgam of opinions from various members, plus supplementary comment from Mr. Kettler of the Fairbanks-Morse Co., was as follows:

As pressure goes down on the discharge gauge, the loss of water will be in relation to the pressure loss. In other words, if the pressure drop is 20 percent the water loss will average 20 to 22 percent. When a system has been in use for several years the gauge is apt to start climbing which will probably be due to scale accumulation in the discharge piping.

Question: Why is a heat exchanger between a liquid and suction line frequently used on a Freon-12 compressor installation?

The following answers were given:

(1) Because pre-cooled liquid goes into the evaporator and picks up more Btu per lb.

(2) Because it will not separate oil in the evaporator and harm the compressor.

(3) To sub-cool liquid in order to cut down flash gas.

(4) To dry out wet suction gas.

Question: What should the discharge temperature be with 25 lb. suction pressure and 165 lb. discharge pressure, and with 50 F. suction temperature at the compressor on a vertical single-acting compressor?

Panel member George Paulick demonstrated by use of the Mollier chart that there should be a maximum of 205 F discharge temperature with no super heat at 25 lb. suction pressure, and that at 50 F. suction temperature, the discharge temperature should be 255 F. or less.

The quiz session lasted for more than an hour with a number of other interesting technical problems submitted for general discussion.

The business meeting which preceded the quiz program was presided over by President Dale Rycraft. Warren J. Howard, Edward Valdez, Henry Novanno and C. W. Renn, all of the Pacific Fruit Express, were initiated as members.

Committee Chairman W. R. Burnett reported that 25 new members had been garnered during the present drive, not counting the four initiated on April 5. The Independents team has thus far signed up 21 new ones, the Union Ice Co. and California Consumers Corp. team, 4.

E. T. Quinn reported that the chapter's 1950 membership register, listing 325 members, would be off the press within a week to ten days.

President Rycraft announced that the annual Old Timers' Night will be held June 21.

Mr. Utescher was introduced by President Quinn and brought the membership up-to-date on the status of the 1950 edition of the Operating Data Book.

George Paulick's preliminary class covering Part II of Principles of Refrigeration, as applied to storage space was conducted from 7:00 to 9:00 p.m.

New Orleans

By Leo Vivien

When the Board of Directors held its meeting for planning the year's work, every board member was present and all had ideas to improve chapter operations. Their enthusiasm and the work accomplished are good omens for the future.

At our regular meeting of January 25, A. O. Festorazzi of the Chrysler Airtemp Corp. delivered a lecture on Refrigerating Compressors and Refrigerating Systems. Mr. Festorazzi's talk was well received by the members. At this meeting, we admitted two new members to the Chapter, Fred Lindsey and Louis Girault.

On February 8, the Chapter was treated to an interesting discussion on Servicing of Compressors and Air Condition Systems by H. R. Styer of the Airtemp Sales Corp. This type of subject is very interesting to the members of our Chapter and was well received. At this meeting Jose A. Rodrigues was admitted as a new member to our Chapter.

On February 22, the membership was informed of the National Membership contest as outlined by the National Membership Chairman and after quite a bit of discussion on the merits of this system, they voted to give it their enthusiastic support. Mr. Festorazzi again appeared before the Chapter to continue his series of lectures and the topic was Evaporative Condensers and Cooling Towers. Received into membership at this meeting was J. H. Kreller.

At the March 8 meeting, the subjects discussed were Balancing of Cooling Coils with Compressors and Chill Water Systems. This was delivered by Mr. Festorazzi.

On March 22, Messrs. Festorazzi and Styer completed their series of lectures on Air Conditioning with a question and answer forum. This series of lectures have been going on regularly since the October 26th meeting and the subject was thoroughly covered by these two excellent instructors.

On March 16, the members of the Chapter enjoyed themselves with a banquet at one of the famous restaurants in the Vieux Carre given by our Quarter Club. The Quarter Club is composed of members of the Chapter in good standing and their sole obligation is to meet quarterly for a couple of hours of fun at which time no engineering problems are allowed.

President Gillio is endeavoring with the aid of his committees to increase the membership and to see that the members are receiving the educational benefits the Chapter usually provides and appears to be on the road to a successful year. Louisiana Chapter normally being a slow starter is beginning to apply the necessary speed to a good ending.

San Jose

By Fred Byl

At our February 27 meeting we had an unusual and very informative talk and demonstration presented by R. W. Kilburn and Bob Roberts of Food Machinery and Chemical Corporation. The subject was "Hi-vacuum Cooling of Lettuce." Modern shipping practice was explained.

The low pressure steam tables were brought out and evaporative cooling explained using a steam jet system to produce the 29 inch vacuum required to produce 35 F. temperature in the center of a head of lettuce. Heat rejection to cool two pounds of lettuce was calculated and converted to evaporation of water in pounds, which proved to be a very small amount. Laws of vapor pressure and evaporation were explained and it was shown that wilting of outside leaves was improbable. A demonstration consisted of a head of lettuce in a laboratory desiccator with a recording potentiometer showing the temperature in the center of the lettuce. This desiccator was connected to a laboratory hi-vac pump. With the small capacity of the pump this lettuce was cooled to 35 F. in thirty-five minutes.

A commercial plant using the de-

scribed plan has been in operation in Salinas for the past season and this program was presented to the members as general information, even though it does present a possible source of competition to the ice industry.

March 13 was a big night for we were the guests of Owens-Corning Fiberglas Corp. at their recently constructed plant in Santa Clara. This plant at present produces many types of Fiberglas insulating boards, mats and loose fill. They are still suffering from growing pains and in the next few months they expect to have production lines in operation producing accoustical tile and pipe covering. Their Santa Clara plant is considered the most modern and efficient in the Fiberglas industry. It was a wonderful evening.

Chicago

By E. B. Jones

The first meeting of the month was held in the office of the Midwest Engineering Equipment Co. The members gathered early and an excellent lunch was served to them.

The principal speaker of the evening was Jack Watkins of the Midwest Co., who discussed liquid return and recirculating systems. From a large colored drawing he explained the operation of a liquid return system using elements he has developed. Then a liquid recirculating system which uses flash gas pressure to recirculate a large excess of refrigerant through the system was described. Mr. Watkins discussed the advantages of such a system which include flushing of oil out of the evaporator system, elimination of closely adjusted controls on evaporators, ability to take advantage of economical condensing pressures during the winter period and other factors. The system is described on Page 49 of the 1949 Operating Data Book. He answered a number of questions about the system and its principles of operation.

The air conditioning course was presented at the following meeting by Leslie Clifford who discussed duct and coil proportioning. He explained that a square section duct has better characteristics as far as air distribution is concerned but such ducts cannot be installed in many locations. The selection of coils was explained in regard to the control of sensible and latent heat. Then Mr. Clifford gave a diagram of interesting installations and described how their requirements had been made.

Special speaker at the meeting was Professor H. G. Venemann who drove up from Purdue University to discuss interesting refrigeration questions he has answered during his more than eight years as chairman of the National Educational Committee. He told how these questions are received from members in this country and abroad. During the time mentioned he has answered 296 questions which have been published and others which were not.

A few questions were answered rather quickly, others required from one hour up to 36 to 48 hours of work. One interesting question dealt with the customary use of heat exchangers on Freon systems and not with ammonia systems. When this matter, which had been taken for granted, was investigated, Professor Venemann found by making typical calculations that the coefficient of performance was increased on the Freon system but was reduced on the ammonia system when the heat exchanger is used.

A question "when is two staging advisable," required very extensive calculation. It is published as question 4-6 on page 69 of the 1944 Operating Data Book. The curves and the detailed tabulation covering many different conditions indicate why Professor Venemann spent over forty-eight hours on this question. He described other interesting questions and told about a proposition for using expansion force of ice to produce power in which the questioner thought he had evolved perpetual motion.

The chapter question box contest was concluded at this meeting. First prize, a ham, was won by J. Messina. Second prize, a book on air conditioning, was won by John Forti. Donor of the ham was Eugene Rytlewski and the book was presented by Les Clifford.

Memphis

By Charles Conley

A talking motion picture "Development of Air Conditioning Equipment" was presented to the regular meeting of the chapter by William Slater of the Slater Engineering Co. This picture showed the various types of air conditioning equipment and the different industries to which they are applied. It gave us a good idea of the importance of air conditioning for process work in numerous industries such as textile, candy, food. steel and many others. Important from the standpoint of comfort and business development were the plants shown in large theatres, department stores and on railroad trains. Other interesting applications were on ocean-going vessels and highway buses. Mr. Slater commented on the picture as it was being shown and answered questions.

The second meeting of the month had a double feature. Local manager Harry Walling of the York Corp. showed a sound movie of their new V W ammonia compressors and another film on their turbo refrigerating machines. On display were several blown up cut-away pictures of their refrigerating machines. Mr. Walling used these to supplement his discussion about this equipment.

A discussion on air conditioning and its applications was presented by Wano E. Thorpe of Flynn & Thorpe Engineering Co. He used the blackboard to illustrate his talk and stressed the humidity side of air conditioning. Mr. Thorpe explained that proper control of relative humidity is a very important ingredient of air conditioning. Without this control, applications of air conditioning to processing and manufacturing are almost worthless. We had a large and interested attendance at this meeting. Welcomed to membership were Donald L. Glaspie of the Shelby-Skipworth Co. Inc., sales engineer, and George C. Hutchinson, assistant engineer T. B. Hospital.

Representatives of the chapter who attended the midwest regional conference at St. Louis were Alvis Clay and Charles Conley. It proved to be a very successful and instructive series of meetings. St. Louis chapter went to great lengths in providing for the attendants and can be proud of the results obtained.

Engineer License Bill Opposed

A BILL introduced in the Rhode Island legislature providing for licensing of stationary and refrigerating engineers and boiler operators is meeting with considerable opposition. Republican state senators in caucus went on record as opposing the bill because of its regulatory features. They stated that it would not afford any additional protection to the public, since those affected by its provisions would be assured of licenses.

The proposed legislation would authorize the state labor director to name a chief examiner at $5,000 a year to administer the Act. The appointee would have to be a practical and stationary engineer of not less than ten year's experience. The bill applies to stationary engines and stationary boilers of more than 30 hp and to refrigerating plants of more than 50 ton capacity. A five-member board of review would be appointed to the state labor department to consider appeals of decisions by the chief examiner.

St. Louis Chapter Sponsors Mid-West Conference

A PRE-SEASON round-up of refrigerating engineers was held in St. Louis on March 25. Sponsored by the local N.A.P.R.E. chapter, it drew attendance from Missouri and nearby states. Headquarters was at the Kingsway Hotel where the meetings and group affairs were held.

The first session was opened by Chairman Les Fleiter of the Conference Committee who welcomed the attendants and described the program to be presented. He invited all present to participate in the discussion. Those who wished to pursue the various subjects further than is possible in a special conference were invited to join the association.

Feature of the meetings were the refrigeration classes held in the morning and afternoon sessions by Professor H. G. Venemann of Purdue who is also chairman of the association's Educational Committee.

Fundamentals of Refrigeration

In the morning session, Professor Venemann discussed fundamentals of refrigeration which are essential to all engineers. Prominent, he said, are the relations between cooling and heating quantities in the heat pump cycle. He explained that all refrigerating systems are heat pump operations although this has not been generally recognized until lately.

Typical refrigeration cycles were traced on the Mollier diagram to show how the coefficient of performance is obtained. Professor Venemann pointed out that this is basic in checking refrigerating systems to obtain the most economical results. Also explained were the use of the steam chart for cooling tower and evaporative problems, and the ammonia chart.

A diagram of a typical system was drawn and it was tied in with the various portions of the refrigerant chart in order to explain how operation of various portions of the system can be checked. Professor Venemann stressed that the maximum economy is obtained when the system operates at the highest practical suction pressure and the lowest discharge pressure. Then he went on to show how theoretical performance characteristics tie in rather closely with actual conditions.

Gages and Thermometers

At the program in the afternoon session, Professor Venemann's subject was "Making Gages and Thermometers Pay Off." First he emphasized the use of accurate instruments. Pressure gages, he declared, should be checked and adjusted at least once a year and more frequently under severe service. Thermometers should be accurate in the beginning and should be protected against abuse. Proper installation was explained because it was pointed out that a liquid column would affect the reading of a gage, also a thermometer should have its temperature sensitive portion placed in the area of temperature measurement.

The method of taking and recording data accurately was explained and then Professor Venemann showed how this data should be used for best results. He gave specific examples of uneconomical operating methods and told how they were corrected. These will be published in an early issue.

The use of a refrigerating system as a source of both heat and cooling for concentrating orange juice was described by Ed Thompson, Majonnier Bros. Co. He gave an excellent exposition of the problem which was to evaporate the heat sensitive juice at low temperature under a relatively high vacuum. The impracticability of compressing the moisture evolved in the process was demonstrated and Mr. Thompson went on to explain the method employed to utilize an ammonia refrigerating system for this purpose. Present applications were described and other uses were predicted.

Broad interest was developed by the question box session on plant operation led by C. M. Renner, St. Louis Dairy Co. The other members of the panel were R. C. Kahdeman, Chas S. Lewis Co; Eugene Kessler, Falstaff Brewing Corp.; O. J. Ruel, David Ranken School of Mechanical Trades; G. F. Uplinger, Swift & Co

Each member of the panel participated in rather extensive discussion of the interesting questions submitted. One of the questions concerned power factor in electrical systems and received most illuminating discussion by O. J. Ruel. Another question which developed considerable interest was the use of a centrifugal compressor with a second refrigerant to operate or supplement existing ammonia installations.

Following luncheon, Emerson Brandt, secretary of the N.A.P.R.E., discussed the engineering and educational methods which produced the most benefit for men engaged in the industry and described how the N.A.P.R.E. is set up to handle this work.

Refrigeration in Europe

After dinner in the evening, Ralph Copp, Meyer Blanke Co., presented an interesting address on refrigeration and engineering in Europe. Mr. Copp who was charter member and first president of St. Louis Chapter organized in 1920 was recently Senior Consultant for the Dairy Branch of the United Nations International Children's Emergency Fund. It was his duty to supervise the setting up of plans to provide healthful milk supplies for children in a number of European countries. He described the primitive facilities which he found in use in several countries during his widespread travels over there. In other countries the methods were more modern but the plant capacities were not sufficient to fulfill the requirements. One of the most critical areas was the Mediterranean territory where 30 percent of the children die before the age of five from undulent fever attributed to defective milk supply. Mr. Copp described what he found in a number of countries and then went on to tell what is being done to alleviate the situation. It was an intensely interesting recital of one phase of the problem in Europe.

The conference was under the direction of General Chairman L. V. Fleiter, assisted by G. F. Uplinger. The chairmen of the special committees were: E. G. Bishop, House Committee; K. M. Holaday, Program Committee; Bryan Elliott, Registration Committee; Eugene Kessler, Finance Committee.

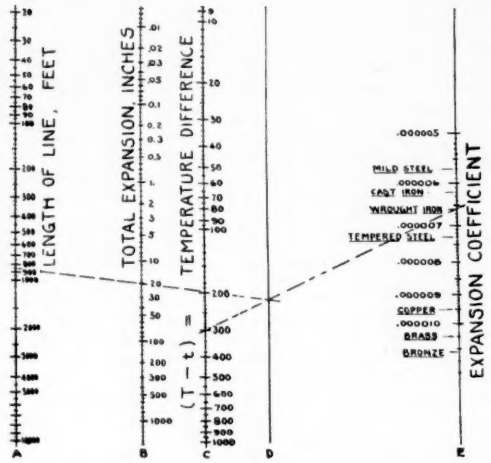
Stanley Petersen Deceased

AFTER a brief stay in a Southern California hospital, Stanley E. Petersen died on March 4. A member of San Francisco Chapter, in recent years Mr. Petersen was associated with the Ralph E. Manns Company in that city. During the winter he became ill and went to Southern California for treatment of a heart condition which, however, did not improve.

ENGINE ROOM POINTERS –

An "All Metal" Expansion Chart

THIS chart will be found useful for quickly determining the expansion of any ordinary metals—from mild steel to bronze—or any material having an expansion coefficient between the limits 0.000005 and 0.000012. The chart handles any length of any of these metals or materials, from 20 ft. to 10,000 ft. For example, how much will 850 ft. of wrought iron pipe expand when the temperature increase is 300 F.?



Connect the 300, column C, with the coefficient of expansion of wrought iron, column E, and locate the intersection with column D. Then from that point of intersection run over to the 850 in column A and the expansion is found to be 20 inches in column B.

So, all one has to do is lay a straightedge across the chart twice and the total expansion in inches is found without bothering one whit with the decimal point or with longhand figuring. If you haven't a straightedge use a thread, a straight piece of paper, or anything else that is convenient and that happens to be straight.

The temperature difference, column C, is found by subtracting the minimum temperature from the maximum. Thus a steam pipe at its coldest may be 40 F. At its hottest it may be 740 F. The difference is therefore 740 - 40 or 700 F.—W. F. S.

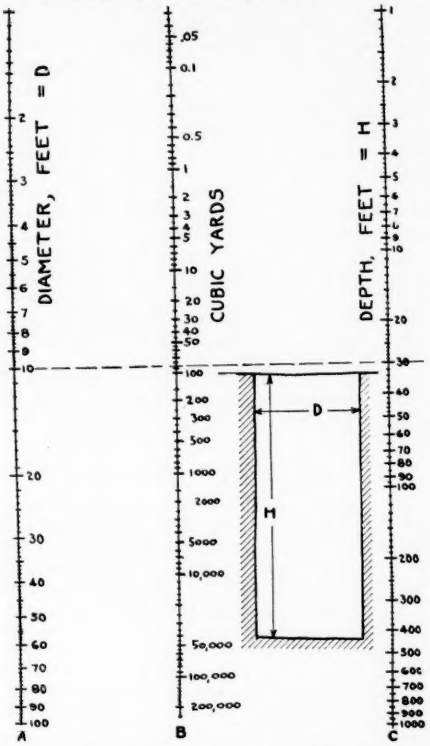
Stainless Steel Not Perfect Metal

MANY readers will doubtless be surprised to learn that stainless steel, too, has its faults. This writer has been lauding the new metal rather enthusiastically and he has now learned that it DOES give trouble once in a while. But, not so much as real stainless steel as when it becomes a modified metal.

For instance, stainless steel makes an excellent lining for tanks. However, during the lining process it is sometimes welded, and that's where the difficulty arises. In the welding process stainless steel often becomes an altered metal and that portion that is altered sometimes does not stand up as well against acids, corrosion, etc., as does the original metal. So, that is an important thing to guard against. As a result some users are now resorting to other ways in which to join the metal so that its composition will not be altered.

A Chart for Circular Excavations

THIS chart will be found handy for determining the yardage in circular excavations such as circular pits, cellars, wells, shafts, etc. It gives the amount of space occupied by circular tunnels or sewers or anything of that sort. Its application to circular excavations is practically unlimited. Simply lay a straightedge across the chart and column B immediately gives the yardage.



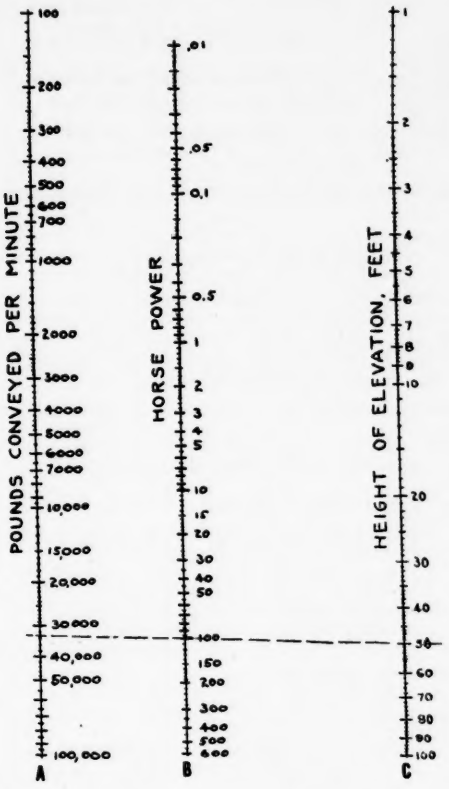
For example: How many yards must be excavated to make a pit 10 ft. in diameter and 30 ft. deep?

Connect the 10 in column A with the 30 in column C and column B at once shows the yardage to be very close to 87 cubic yards.

The chart will be found to be sufficiently accurate for nearly all work of this nature, and the range of the chart is wide enough to include nearly every size of circular excavation ever made, or likely to be made.

What Horsepower Will Be Required To Handle Materials?

IN one simple operation this chart tells the horsepower required to drive the average conveying machinery for handling different materials — coal, grain, gravel, dirt, ashes, clinker, cement, ore, rock, sand, etc.—anything that is handled and elevated by machinery.



Just lay a straightedge from "Pounds conveyed per minute," column A, to the height of elevation, column C, and the horsepower is immediately found in the intersection with column B.

For example, the dotted line drawn across this chart shows that where 33,000 pounds of material are conveyed per minute, the height of elevation being 50 feet, column B shows that 100 horsepower is the average requirement for power.

In the event that you know the efficiency of your conveyor, which may be better or poorer than the average, do this: Divide 50 by the known efficiency of your conveyor and then multiply the quotient by the horsepower obtained in column B.

Thus for example let us say that you want to convey 33,000 pounds of material to a height of 50 feet, which is the same problem as above. But the efficiency of your conveyor is 80 per cent. We then have this: 50 divided by 80 equals 0.625. Multiplying the 100 obtained in column B by 0.625 we get 62.5 horsepower as the power required to do the work.

It will be noted that the range of the chart is great enough to take care of most drives, from a hundredth of a horsepower to 600 horsepower. Any able bodied man can do a hundredth of a horsepower, easily. 600 hp., though is considerable power. It isn't often that 600 hp. is devoted to the conveying of materials alone.

Why Do Furnaces Burst and How to Prevent Their Bursting

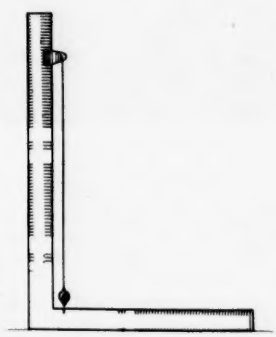
A MISTAKE that is entirely too commonly made today is the failure by operators to thoroughly ventilate a furnace before introducing a flame in that furnace to start a new fire. If the furnace still contains combustible gas, as furnaces often do, the situation is similar to the inside of an internal combustion engine cylinder and a sudden pressure commonly called an "explosion" is the result. The furnace will surely burst.

There is a very interesting chapter entitled, "Explosion in a Closed Cylinder" in Dugald Clerk's book, "The Gas and Oil Engine," in which the author shows that one volume of coal gas and 13 volumes of air will create a gage pressure of 52 lb. per sq. in. in the vessel when ignited. One volume of gas and 5 volumes of air will create the maximum pressure of 96 lb. per sq. in. A mixture leaner than 1:13 will not ignite.

Using the lowest pressure, 52 lb. per sq. in., let us compute the total pressure that will result against a furnace wall 6 ft. high by 12 ft. long, which is a common size today. The area will be 6 x 12 x 144 or 10,368 sq. in., and the total pressure will be 10,368 x 52 or 539,136 pounds. More than half a million pounds! That explains why furnaces burst. And if the mixture should happen to be as rich as 1:5 the total pressure will be close to one million pounds. To attempt to build a furnace strong enough to withstand such pressures would be both uneconomical and foolish. It is much simpler, less costly, and safer to carefully ventilate furnaces before starting new fires.—W. F. S.

How to Convert a Steel Square Into a Sensitive Level

YOU can easily convert your steel square into a combination level and steel square by doing as indicated in the sketch herewith. When the plumb bob, suspended as shown, points to the mark indicated, the vertical thread being parallel with the vertical leg of the square—then the surface is level, or, the upright is plumb.



You will find this device to be exceedingly sensitive, even more sensitive than the regular bubble level. This writer has been using his long enough to know that it gives more accurate results than his bubble level.

Refrigerated Warehousing Industry

NEWS • ARTICLES • ANNOUNCEMENTS

NATIONAL ASSOCIATION of REFRIGERATED WAREHOUSES

Division of American Warehousemen's Association

Executive Offices:
Tower Building, Washington 5, D. C.
Executive Vice-pres., Wm. Dalton
Secretary, Jos. H. Colquitt

President, J. L. Gagini
Omaha, Nebr.
Vice-president J. P. Johnson
Washington, D. C.
Treasurer, Wm. A. Moore
New Orleans, La.

Gagini Points to Need for Fighting Socialization Theories

"TITHE your time to fight for free enterprise" was the advice given to industry members by newly-elected N.A.R.W. President Julius Gagini in his first general statement, released from the Association's headquarters in the Tower Building, Washington, D. C. Pointing out that industry must act now to defeat the efforts of those who would halt social progress, Mr. Gagini characterized the situation as a battle for men's minds.

J. L. Gagini, Omaha, Nebr.
President National Association
Refrigerated Warehouses

"Your enemies—the enemies of the system that makes your business possible—are hard at work, and they're making progress under the guise of the 'welfare state'", Gagini warned.

He appealed to businessmen to allot a certain portion of their time for direct action toward winning the support of the common man. Gagini quoted Dr. Robert E. Wilson, Chairman of the Board of Standard Oil Company (Indiana), saying that the average man must be shown that his interests are definitely affected by industry's problems. Mr. Gagini stated that it is time for businessmen to stop apologizing for capitalism. Instead, they must see that their side of the story is properly told to the public whose support they need in the fight to protect free enterprise.

As a starting point, Gagini suggested that the individual members check their lines of communication to their employees. Employer-employee communication must be used, he said, to carry the facts which will help win labor away from the false promises of socialism.

Refrigerated Storage Facilities Keep Pace With CUSTOMER DEMAND

TEN million cubic feet of modern refrigerated storage space have been added to existing facilities in the past five years, the National Association of Refrigerated Warehouses revealed.

Freezer space to meet the needs of the growing Frozen Food Industry accounts for most of the expansion, it said.

Emphasizing that existing facilities are not overloaded, NARW quoted the U. S. Department of Agriculture.

Speaking through William Dalton, its Executive Vice President, the Association asserted that the cold storage industry is constantly being modernized. Old plants and buildings are now being renovated. Equipment is being mechanized.

The industry will be ready, Dalton stated, to meet future needs for cold storage service, whatever they may be.

He pointed out the high cost of doing business as a refrigerated warehouseman. Warehouses must be 50 to 75 percent full to break even. (According to a March 1, 1950 Department of Agriculture survey, average occupancy of the nation's refrigerated warehouses is only 74 percent of capacity.)

Cold storage men are proud of their past record, Dalton declared. He maintained that the industry has proved its ability to provide good service at reasonable cost. They are confident, he continued, that their future record will be even better in that respect.

Southwestern Chapter N.A.R.W.

THE spring meeting of the Southwestern Chapter of the National Association of Refrigerated Warehouses will be held at the Shamrock Hotel, Houston, Texas, Friday, May 19. Wm. Dalton, executive vice-president of the National association and H. C. Diehl, director of The Refrigeration Research Foundation will be among those present, both of whom will talk on subjects of special interest to refrigerated warehousemen.

Cold-Storage and Non-Storage Eggs Retain About Same Quality

WHEN their interior quality is approximately the same, eggs removed from cold storage and eggs that have not been in cold storage lose quality at about the same rate. This was indicated in recent studies made by the U. S. Department of Agriculture under the Research and Marketing Act to test the widely held opinion that cold-storage eggs lose quality more quickly than non-storage eggs.

Groups of both cold-storage and non-storage eggs, of comparable quality, were examined after being held at various temperature levels for various periods. This examination including candling, as well as determination of broken-out score and other measurements of quality made after the eggs were broken out. Decreases in interior quality were found to be similar for the two kinds of eggs at each temperature level and after each holding period. When held at the same temperature and for the same length of time, both kinds of eggs tended to lose weight at approximately the same rate.

The research work was done jointly by the Bureau of Animal Industry of the Agricultural Research Administration and the Poultry Branch, Production and Marketing Administration. A copy of a more detailed explanation of the work may be obtained upon request to the Information Branch, Production and Marketing Administration, U. S. Department of Agriculture, Washington 25, D. C.

For eggs held in storage for twenty-four weeks the general picture is given in the chart reproduced below. As might be expected, the weight loss during holding increased as the temperature increased.

Refrigeration Research Foundation Announces New Projects

AT a meeting held in Chicago, January 29, the executive committee of The Refrigeration Research Foundation approved a number of additional grants to the following research projects:

No. 2—Study of causes and prevention of undesirable changes in quality of fresh and frozen gulf shrimp in refrigerated storage, Louisiana State University, E. A. Fieger. leader.

No. 16—Heat transfer aspects of refrigerated warehouse packaged goods in steady and unsteady state as a function of physical properties and conditions, Columbia University, C. F. Kayan, leader.

No. 32—Effect of variation and fluctuation in temperature during course of transportation and warehousing of frozen foods, Western Regional Research Laboratory (Albany, Calif.), R. R. Legault, leader.

No. 34—Effect of refrigeration storage on popping volume and quality of popcorn, Iowa State College, J. C. Eldredge, leader.

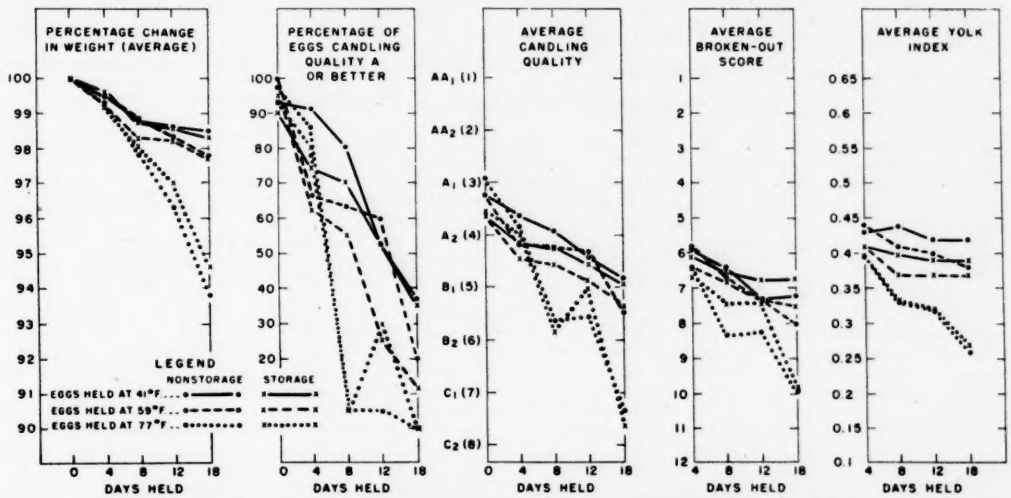
No. 36—Storage of candy, Georgia Agricultural Experiment Station, J. G. Woodroof, leader.

No. 38—Refrigeration of peanuts and pecans for making candies the year round, Georgia Agricultural Experiment Station, J. G. Woodroof, leader.

No. 35—Freezing and frozen storage of crab meat, Fish and Wildlife Service, U. S. Department Interior, C. F. Evers and J. M. Lemon, leaders.

Government Reports Commodity Sales

THE Commodity Credit Corporation, U. S. Department of Agriculture, announces that since the beginning of sales of its commodity holdings in January of this year, sales for export reported as of March 30 totaled $2,311,658 covering the following commodities: dried whole eggs, 244,386 pounds, $96,002; shelled peanuts, 11,000,000 pounds, $893,750; great northern beans, 23,250 cwt $139,134; barley, 414,000 bu., $538,200; corn, 422,500 bu., $606,150; fresh Irish potatoes, 2,500,000 cwt, $25,000; frozen turkeys, 48,645 pounds, $13,422.



Changes in weight and quality of storage and non storage of eggs, during specified holding periods.

Government Offers Frozen Turkeys for Sale for Export Only

THE United States Department of Agriculture has announced the proposed sale by the Commodity Credit Corporation of approximately 9,000,000 pounds of frozen dressed young turkeys. Offers to purchase will be considered from foreign governments or their agents, international relief feeding organizations, brokers or exporting concerns, but not from any agency of the United States Government. Such offers must certify that the quantities purchased will be exported and not thereafter imported. No funds transferred by grant pursuant to any law of the United States providing for the furnishing of assistance or relief to foreign countries may be used by the exporter or by any subsequent buyer in paying for any frozen turkeys purchased hereunder.

All lots consist of 1949 crop turkeys that were dressed during the period of August 1 to December 31, 1949. They were acquired by CCC under the Department's turkey price support program. The turkeys are New York dressed, box-packed and USDA graded as evidenced by Terminal Market Poultry Grading Certificates issued at the time they were purchased.

The frozen turkeys are offered for sale in their present containers on the basis of f.a.s. vessel at any U. S. port, or, at the option of the Purchaser, f.o.b. cars or trucks at their present locations. When sales are made on the latter basis, the selling price per pound will be reduced by an amount based on the export freight rate from the warehouse to the nearest port, for the gross weight of the quantity purchased.

Purchasers desiring to process the frozen turkeys and to export the resultant boned and canned product may obtain permission to do so, providing they agree to such supervision of plant operations and to maintain such records as CCC may require.

The frozen dressed turkeys are now in refrigerated warehouses located in various cities in the country with holdings as shown in the following table:

	Pounds
California	
Fresno—Consumers Ice Co.	89,900
Fresno—Valley Ice Co.	21,710
Los Angeles—Federal Ice & Cold Storage	115,760
Los Angeles—Los Angeles Cold Storage Co.	80,890
Los Angeles—National Ice & Cold Storage Co.	175,939
Los Angeles—Terminal Refrigeration Co.	50,615
Modesto—Modesto Refrigeration Co.	1,674,638
Sacramento—Bercut Richards Cold Storage	92,101
San Francisco—National Ice & Cold Storage	308,912
San Francisco—Merchants Ice & Cold Storage	74,238
Stockton—National Ice & Cold Storage Co.	89,641
Watsonville—National Ice & Cold Storage Co.	29,101
Colorado	
Pueblo—American Stores Cold Storage Co.	97,830
Idaho	
Nampa—Terminal Ice & Cold Storage	72,693
Illinois	
Chicago—Central Cold Storage Co.	21,244
Chicago—Columbia Cold Storage Co.	366,023
Chicago—Fulton Market Cold Storage Co.	275,121
Chicago—Produce Terminal Cold Storage Co.	112,957
Chicago—U. S. Cold Storage Corp.	19,489
Massachusetts	
Boston—Quincy Market Cold Storage Co.	47,834
Michigan	
Detroit—U. S. Warehouse Co.	68,610
Minnesota	
Minneapolis—Minneapolis Cold Storage Co.	73,277
Missouri	
Carthage—Carthage Ice & Cold Storage Co.	20,013
Kansas City—U. S. Cold Storage Co.	94,230
Nebraska	
Omaha—Omaha Cold Storage Co.	376,745
York—York Cold Storage Co.	107,363
New Jersey	
Jersey City—Merchants Refrigerating Co.	488,893
Jersey City—Seaboard Terminal & Refrig. Co.	29,872
Jersey City—Union Terminal Warehouse Co.	1,674,309
New York	
Buffalo—Merchants Refrigerating Co.	147,850
New York—Manhattan Refrigerating Co.	335,283
New York—Merchants Refrigerating Co.	180,042
Ohio	
Cleveland—Distribution Terminal Ware. Corp.	313,399
Oregon	
Portland—North Western Ice & Cold Storage Co.	22,788
Pennsylvania	
Philadelphia—Philadelphia Whse. & Cold Stg. Co., Whse. C	30,827
Philadelphia—Quaker City Cold Storage Co.	121,089
Philadelphia—Quaker City Cold Storage Co.	86,102
Utah	
Provo—Utah Ice & Cold Storage Co.	61,436
Virginia	
Harrisonburg—Casco Refrigerating Corp.	359,222
Washington	
Seattle—Central Refrigerating Corp.	181,028
Seattle—Diamond Ice & Storage Co.	37,317

Bulletin Summarizes Information on Handling Potatoes

A DIGEST of information on the subject of handling, storage, transportation and utilization of potatoes, published mostly from 1938 to 1948 has been issued by the United States Department of Agriculture, prepared by Dean H. Rose, senior physiologist and Harold T. Cook, senior pathologist of the Division of Fruit and Vegetable Crops and Diseases.

In the conclusion of the 164 page publication it is stated that one of the most important of the many problems discussed is that of mechanical injury and what to do about it, but it is stated that doing research work and publishing the results do not seem to be enough because prevention depends upon those who handle the potatoes and editorial campaigns appear to have little effect upon them. The suggestion is made that intensive and untiring efforts are necessary at the working level near important potato producing areas and among all of the larger markets to impress upon those who do the physical handling, the fact that potatoes cannot safely be banged around like coal or gravel. Although they may not rate the degree of careful handling given to dessert varieties of plums and pears, they certainly can be handled more carefully than they are now without cost to the consumer being raised unjustifiably high.

Alford Warehouses Completed

AFTER three years of construction, with completion of the administration building, the Alford Refrigerated Warehouses at Dallas, Tex., is functioning as a completed establishment. This large refrigerated warehouse involved an expenditure of nearly 6 million dollars.

The plant consists of two warehouses each more than 1700 ft. long and 250 ft. wide, spacious streets and driveways, a girdle of railroad trackage, and an administration building with 70,000 sq. ft. floor space. One of the warehouses provides 7,500,000 cu. ft. of refrigerated space, the other, of equal size, provides space for dry storage.

Refrigerated Warehousing Group Approves Revised Trade Practice Rules

AT A CONFERENCE conducted by the Federal Trade Commission in Chicago on March 23, representatives of the refrigerated warehouse industry approved a set of trade practice rules for the industry. These proposed rules have been made available to members of the industry and other affected and interested parties. Then pending consideration for final approval by the commission a publicly announced hearing will be held. The date and place of this hearing will be announced later.

The Chicago conference was supervised by Commissioner John T. Carson. Presiding during the consideration of the rules was H. Paul Butts, attorney, of the Trade Practice Rules Bureau in association with Paul Cameron also of the bureau.

Earlier Rules Revised

Principally the proposed rules are a revision of an earlier set promulgated for the industry in 1931. The draft presented at the conference was the result of work of a committee headed by Jerry P. Johnson, Washington, D. C., who acted as principal spokesman for the industry in the deliberations. President J. L. Gagini of the National Association of Refrigerated Warehouses presented a brief but thorough resume on the history and operations of the industry as well as its importance to the food supply and commerce of the nation.

Other members of the N.A.R.W. committee were: W. A. Moore, New Orleans, La.; F. F. Alford, Dallas, Tex; Vallee O. Appel, Chicago, Ill.; H. C. Herschman, South St. Joseph, Mo.; H. J. Nissen, Los Angeles, Calif.; Chas. B. Hart, Tacoma, Wash.; A. W. Hahn, Colorado Springs, Colo.; S. F. Kensil, Philadelphia. Pa.

Following the Trade Practice Conference, Government and industry officials get together for an informal discussion. Emerson Brandt, Technical Editor of Ice and Refrigeration; Julius Gagini, NARW President; FTC Commissioner John Carson, who conducted the meeting, and R. M. Conner, Chairman, Great Lakes Chapter of NARW who acted as host to the group.

The revised trade practice rules as they were presented and approved by members of the industry at the meeting held March 23 are as follows:

Group I

The unfair trade practices embraced in the Group I rules herein are considered to be unfair methods of competition, unfair or deceptive acts or practices, or other illegal practices, prohibited under laws administered by the Federal Trade Commission; and appropriate proceedings in the public interest will be taken by the Commission to prevent the use, by any person, partnership, corporation, or other organization subject to its jurisdiction, of such unlawful practices in commerce.

Rule 1. Deceptive Issuance of Warehouse Receipts. It is an unfair trade practice for any member of the industry to issue or cause to be issued any warehouse receipt which is knowingly or wilfully false, misleading or deceptive to a third party, where the effect may be to unduly hamper, injure or prejudice competitors in their business.

Among the acts inhibited by this rule are:

(a) issuing warehouse receipts without having actual control of the products for which the receipt is issued.

(b) issuing negotiable warehouse receipts for goods of which the issuor is part or sole owner without full and non-deceptive disclosure of that fact.

Rule 2. Delivering Goods When Negotiable Warehouse Receipt is Outstanding and Uncancelled. It is an unfair trade practice for any member of the industry to deliver part or all of any lot of stored products for which a negotiable warehouse receipt (the negotiation of which would transfer the right to the possession of such products) has been issued and is outstanding and uncancelled, without obtaining the possession of such receipt, or taking up and cancelling the same, or placing a statement of what products have been delivered plainly upon it, at or before the time of the delivery of such products, with the effect of unduly hampering, injuring or embarrassing competitors in their business.

Rule 3. Use of False Means and Devices. The offer for sale or contracting to furnish any service of the industry by any false means or device which has the tendency and capacity to mislead or deceive customers or prospective customers, is an unfair trade practice.

Rule 4. Commercial Bribery. Directly or indirectly to knowingly give or permit to be given or offer to give money or anything of value to agents, employees or representatives of customers or prospective customers or to agents, employees or representatives of competitor's customers or prospective customers, without the knowledge of their employers or principals, with intent to induce their employers or principals to purchase or contract to purchase industry service from the maker of such gifts, or offer or to influence such employers or principals to refrain from dealing or contracting to deal with competitors, is an unfair trade practice.

Rule 5. Inducing Breach of Contract. It is an unfair trade practice to induce or attempt to induce the breach of existing lawful contracts between competitors and their customers, or their suppliers, by any false or deceptive means whatsoever, or to interfere with or obstruct the performance of any such contractual duties or services by any such means, with the purpose and effect of unduly hampering, injuring, or embarrassing competitors in their business.

Rule 6. Selling Below Cost. The sale or contracting to knowingly furnish storage, space, sevice, merchandise handling, and/or facilities incidental to warehousing below cost, with the intent, and with the effect of injuring a competitor and where the effect may be to substantially lessen competition or tend to create a monopoly or to unreasonably restrain trade, is an unfair trade practice.

Rule 7. Representations Concerning Facilities. The knowingly making or causing or permitting to be made or published any false, untrue, or deceptive statement by way of advertisement or otherwise concerning the quality, character or nature of any service or facility of the industry, having the tendency and capacity to mislead or deceive, is an unfair trade practice.

Rule 8. Defamation of Competitors or Their Facilities. The defamation of competitors by knowingly and intentionally falsely imputing to them dishonorable conduct, inability to perform contracts, questionable credit standing, or by other false representations, or the false disparagement of the grade, or quality of their services or facilities, with the tendency and capacity to mislead or deceive, is an unfair trade practice.

Rule 9. Procurement of Competitor's Confidential Information. It is an unfair trade practice for any member of the industry to obtain information concerning the business of a competitor by bribery of an employee or agent of such competitor, by false or misleading statements or representations, by the impersonation of one in authority, or by any other unfair means, and to use the information so obtained in such manner as to knowingly and wilfully injure said competitor in his business or to suppress competition or unreasonably restrain trade.

Group II

Compliance with trade practice provisions embraced in Group II rules is considered to be conducive to sound business methods and is to be encouraged and promoted individually or through voluntary cooperation exercised in accordance with existing rules and regulations. Nonobservance of such rules does not per se constitute violation of law. Where, however, the practice of not complying with any such Group II rules is followed in such manner as to result in unfair methods of competition, corrective proceedings may be instituted by the Commission as in the case of violation of Group I rules.

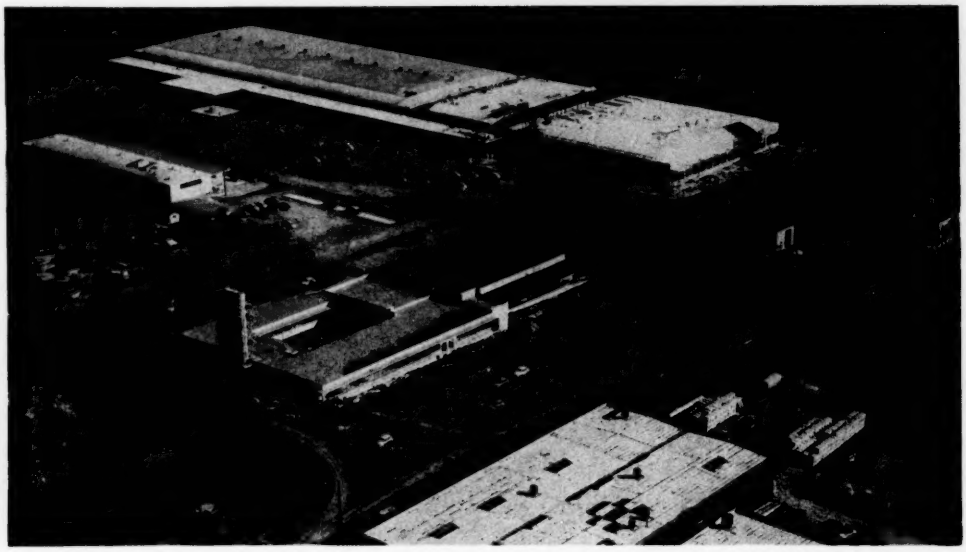
Rule "A" Publishing of Tariffs—Establishing and Adhering to Rates, Charges, Terms and Conditions in Tariffs. Each member of the industry, while exercising his individual judgment as to his rates and charges and their application to individual lots of varied sizes, and quantity on volume discounts, should establish and openly state them with his terms and conditions and shall in good faith publish them in a schedule or tariff and should offer and make them, without misrepresentation, so long as they are in effect. Any deviation from this ordinary course of business is condemned by the industry.

Rule "B" Excessive Extension of Credit and Unsound Collateral or Unsecured Loans. Reasonable extension of credit and the making of secured loans at prevailing interest rates to storers and customers is normal warehouse business. However, extending excessive credit and the making or offering to make of collateral or unsecured loans not in conformity with existing current sound banking principles are condemned by the industry.

Rule "C" Dissemination of Credit Information. The industry records its approval of distributing to its members information covering delinquent and slow accounts insofar as this may be lawfully done.

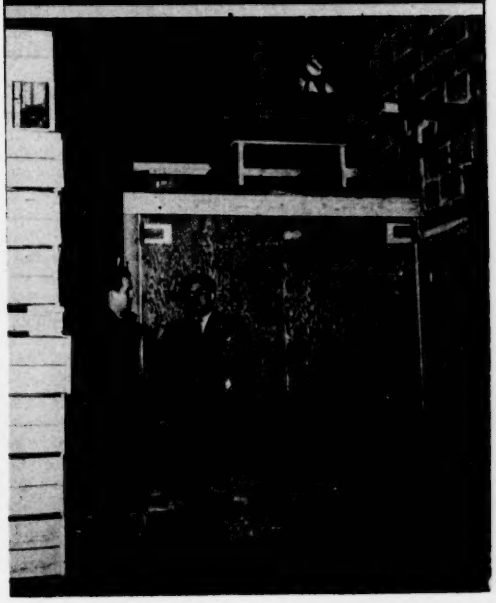
A committee on trade practices is hereby authorized to cooperate with the Federal Trade Commission and to perform such acts as may be legal and proper in the furtherance of fair competitive practices and in promoting the effectiveness of the rules.

Lucky Stores Complete New Warehouse at Oakland, Calif.



The above aerial photo taken recently depicts progress on new $1,500,000 warehouses and administration offices of Lucky Stores, being constructed on a 20 acre plot in San Leandro at First and Merced Avenues, Oakland, Calif. Lucky's huge 164,000 square foot warehouse serviced with two rail sidings is shown at top of picture, with truck maintenance and service shops at the right. At the left are the carpenter and other maintenance shops. New administration office building at lower center.

Construction, which commenced with ground breaking ceremonies on August 2, 1949 under supervision of MacDonald, Young, & Nelson, Inc., general contractors, is on schedule. Rail car deliveries direct to the new warehouse were scheduled to commence about February 15, with a complete move of office personnel and equipment scheduled for early in May. Plans are under way for a typical "Lucky" open house some time in June, to which the public will be invited.



Top: Dr. George Mattus, Virginia Polytechnic Institute, inspects a block of "Virginia Queen" apples protected by air purification system at the Virginia Apple Storage, Winchester, Va.

Bottom: Jack Pierce, Haddonfield, N. J., questioning air purification expert, Dr. R. M. Smock, Cornell University, about Pur Air Activated carbon system used in Hill High Orchards, Round Hill, Va.

Researchers Study

Air Purification In Apple Storages

A FOUR day activated carbon tour was held in the East recently, arranged by Arthur W. Cox, Hagerstown, Md., who had as his guests Professors R. M. Smock, Cornell University; F. W. Southwick, University of Massachusetts; and G. E. Mattus, Virginia Polytechnic Institute. The tour included a review of early developments and recent improvements in the science of improving the storage quality of apples by air purification.

Leading research men recently toured four states inspecting activated carbon installations in refrigerated apple storages ranging from 15,000 bushels to 175,000 bushels capacities.

The field trip commenced with an inspection of the modern storage facilities at S. A. Heisey and Sons Orchard, Greencastle, Pa., where over 70,000 bushels of apples are processed through their 40,000 bushel Pur Air carbon equipped reverse airflow system storage rooms. Ten boxes of fruit were opened to check on quality after seven months of storage. Sam Heisey stated that his apples are keeping better due to the activated carbon air purification.

The group included Professors Smock, Southwick, Mattus, Mr. Cox, Ted Barnebey, manager Pur Air Division, American Solvent Recovery Corp., Columbus, Ohio; E. C. Cameron, Boise, Idaho; J. R. Worden, Buffalo, N. Y.; E. J. Meeteer, Charlottesville, Va.; J. Pierce, Haddonfield, N. J.; G. Wallace, D. Mort, and G. Vink of Waynesboro, Pa.

Ed Hepburn conducted the group through the 100,000 bushel storage facilities of the Dillon Orchards, Hancock, Md., where a central air system provides efficient refrigeration control. At Virginia Apple Storage, Winchester, Va., the visitors were escorted through the 60,000 bushel, expansion coil refrigerated room where four Pur Air activated carbon purification units continually remove the apple gases providing firmer apples, with natural flavor which retain their orchard fresh quality.

Henry Miller, internationally known grower of "Mountaineer Brand" apples, and his associates of the Consolidated Orchard Company, Paw Paw, W. Va., displayed their modern packing plant and 175,000 bushel storage which is the largest activated carbon equipped plant in the world. Following a most interesting tour, the group were luncheon guests of Mr. Miller.

Col. and Mrs. Frank Sleeter entertained the group at a cocktail party following inspection of their new packing and storage plant at the Hill High Orchards, Round Hill, Va. Mrs. Sleeter has won the B. & O. Quality Club award two successive years for superior fruit quality.

The entire group held a discussion session at Mr. Cox's mountain retreat "Lichen Lodge" near Smithburg, Md. Activated carbon air purification was developed by Dr. R. M. Smock Cornell University, and commercial equipment is now available for refrigerated fruit storage facilities. This modern application of the military gas mask is proving to be an effective tool in the hands of progressive orchardists throughout the United States.

The Storage of Dates

EXCEPT for war years, importations of dates into the United States have run slightly over 20,000 tons annually during the past 30 years according to a bulletin issued by The Refrigeration Research Foundation. Production in the United States (95 per cent in southern California, mainly in the Coachella Valley) has varied widely—17,400 tons in 1946; 6,800 in 1945; 13,190 in 1944; and less than that in earlier years.

Dates are harvested from the palm trees during a 4-to-6-week ripening period. After harvest they must be cleaned and cured. Curing is essentially a process of reduction of moisture content and it must be done as quickly as possible without excessive heating. Because dates within the large branches ripen unevenly, there is likely to be a persistent variation in their moisture content. Deterioration may be of several kinds.

1. Loss of natural color and flavor.
2. Development of sirupiness—or inversion of the cane sugar.
3. Souring as a result of excess moisture.
4. Mold, also due to excessive moisture.
5. Insect infestation.

These changes are hastened by heat and absorption of moisture and reduced by cold and low humidity atmosphere.

Exposure of dates to humid environment at any time is likely to result in moldiness if not corrected. A few high-moisture dates in a box may be responsible for initial molding, which will spread to others. Official grading does not of course show this variation. Well cured dates will contain less than 20 per cent moisture. For these reasons it is well to hold relative humidity down below 75 per cent (and it can go as low as 50 per cent at cooler temperatures without harm to the dates) so that the dates will not pick up moisture from the air. Tests have shown that Deglet Noor dates with 14 per cent moisture content held at 34 F. gained 5.4 per cent in weight at 75 per cent rh and 7.9 per cent at 86 per cent rh—thus demonstrating the need for low relative humidity. At higher temperatures, lower relative humidity would be required to maintain equilibrium than at 32 F.—thus the lower temperature is advantageous from the standpoint of humidity as well as temperature.

Temperature Requirements

With reference again to temperature requirements, soft dates have been held successfully at a number of freezing temperatures even as high as 28 F., although of course the actual freezing point of dates is much lower than that. However, since molds and yeasts will develop slowly at temperatures above 15 F., freezer storage should always be at temperatures below that figure. Storage at 0 F. is usually commercially most feasible, although 10 F. storage can be used. In other words, dates are wholly tolerant of freezing storage temperatures and show no adverse effects probably because their freezing points generally lie below the suggested freezer storage temperatures.

It may be of interest to give the freezing points of American-grown dates as given by R. C. Wright in USDA Circular 447:

	Avg.	Min.	Max.
Barhee	+0.4	—5.5	+3.7
Deglet Noor	—5.8	—8.0	—.8
Halawy	—7.5	—13.8	—3.3
Khadrawy	—6.5	—8.0	—5.6
Thoory	—1.0	—2.7	+2.2

The report is summarized as follows:

1. It is important to know whether dates are of the sucrose or hard type such as Deglet Noor, which is the most important California-grown variety, or of the invert-sugar or soft type such as Halawy, Khadrawy, and Zahidi; Saidy or Maktoom, the latter grown primarily in Arizona.

2. Soft type dates, if cured, can be kept until the Christmas holiday season at 28-32 F., but if stored longer should be at 15 F. or lower. Relative humidity at 28-32 F. should be 75 per cent or preferably somewhat lower. Non-cured grades of this type require 0 to 10 F. even for short time storage and at these freezer temperatures maintenance of proper relative humidity is not usually a problem.

3. Hard type dates, if cured and dry, will keep well until March at 28 to 32 F. and for a year at 24 to 26 F., but can usually be most conveniently stored in freezer storage at 0 to 10 F. Very mature Deglet Noors which have become sirupy should be stored at 0 to 10 F. Uncured hard type dates should always be stored at 0 to 10 F.

4. Dates absorb moisture and odors readily from the air. If 75 per cent or lower relative humidity cannot be maintained in "cooler" storage, it is advisable to store the dates in "freezer" storage.

5. For any extended storage of dates beyond the winter holiday season, it is preferable and safest to store all types at 0 to 10 F.

Using Activated Carbon for Odor Control of Shell Eggs

AN experiment on the use of activated carbon for control of odors in shell egg storage was made last year by Dr. Mary E. Pennington and Paul B. Christensen of the Merchants Refrigerating Co., New York City. Details and results of the experiment are given in a recent news letter issued by the Refrigeration Research Foundation.

They used two rooms, one with and one without activated carbon. The control room (without carbon) had had a fresh and thorough cleaning, was "spic and span" as Dr. Mary Pennington puts it—thoroughly overhauled, painted, and refreshed with ozone and finally with fresh air. They used very good quality eggs, some shell-treated with oil and others not treated. They used a jury of tasters to test quality.

They found the eggs in the room with activated carbon filter slightly better when tasted immediately after removal, especially during the earlier periods of storage. This was true of both oiled and natural eggs. The difference was not great. As the season progressed the air in the carbon-treated room acquired a freshness that the other did not have.

They deliberately exposed a few cases of eggs to a situation in which they acquired odors and then returned them to the two rooms to see whether one room or the other would remove the odors faster—if at all. There was improvement in both rooms in the course of several months, and greater improvement in the room with activated carbon. After several months, samples were taken home and held in fresh cartons in a refrigerator, and then cooked in various ways; these eggs were satisfactory, whether oiled or not and whether from the carbon-treated room or the control.

The test indicates that activated carbon may be effective for removal of odors in an egg storage room. Apparently almost the same result was achieved in the control room by the recent overhauling, cleaning and painting. It seems appropriate to conclude that the carbon speeds up the removal of product odors—that is, it does the job quickly and thoroughly. If other product odors, in massive quantities, had required removal, the carbon room might have shown greater advantage.

1949 Cold Storage Holdings Show Decrease Toward Prewar Levels

UTILIZATION of space in public cold storage warehouses during 1949 dipped toward prewar levels for both coolers and freezers according to a report by the Production and Marketing Administration of the U. S. Department of Agriculture. Average occupancy in cooler space for 1949 was 54 percent, the same as reported for 1941. Public freezer occupancy, at 66 percent, was one point above the 1940 level and five points below the 1941 level. Utilization of cooler space during 1949 ranged from a low of 48 percent (March 1) to a high of 68 percent (November 1) while freezers ranged from 59 (June 1) to 73 percent (December 1). Less than half of the nation's public cooler space was used for storage in March, April, and May. This was the first time since 1941 that such a low level was reported for three consecutive months. A record seasonal low since prewar years was also established in freezer space occupancy, when, on June 1, only 59 percent of freezer space was being used. Not since June 1, 1940, had freezer occupancy been at this low level. The nation's foodstuffs under refrigeration during 1949 averaged 4.3 billion pounds monthly. Total weight in storage was at a maximum on November 1 when 4.6 billion pounds were reported under refrigeration, which compares to the all time record high of 4.9 billion pounds reached on December 1, 1947. Public cold storage warehouses on November 1 held about half the total weight of foodstuffs under refrigeration, but more than 70 percent of the commodities in freezer storage were in public refrigerated facilities.

Fruits and Vegetables

Fresh apples in storage each month during the first half of 1949 were below the monthly average for the 5-year period ended 1948. The new crop, which moved into storage during September, raised first-of-the-month holdings to above average amounts during the remainder of 1949. At the peak—November 1—35 million bushels of apples were in storage, which compares with the record high of 36 million bushels reached on December 1, 1937. Fresh pears in storage during 1949 reached their maximum on September 1, with a total of 5 million bushels. Average first-of-the-month stocks in 1949 for frozen fruits were 304 million pounds. This compares with 323 million pounds reported in 1948 and the 5-year average monthly holdings of 312 million pounds. New highs were reached in 1949 in holdings of fruit juices, including purees, and raspberries. The former at its peak totaled 64 million pounds (June 1), while the latter amounted to 36 million pounds (September 1). There were less asparagus, brussels sprouts, sweet corn, green peas, pumpkin, and squash in storage during 1949 than a year ago. However, stocks of lima beans, snap beans, broccoli, cauliflower, and spinach were stored in greater quantity than in 1948.

Dairy and Poultry Products

Creamery butter in storage during all of 1949 exceeded 1948 monthly holdings. By October 1 stocks reached 154 million pounds compared to 98 million pounds, the peak of a year ago. American cheddar cheese stocks, slightly below last year's level at the start of the year, surpassed 1948 storage holdings during most of 1949. Shell egg holdings never went higher than 2.3 million cases during 1949 and were as low as 144 thousand cases. During all of 1949 frozen eggs in storage were below average and the stocks of the preceding year. Poultry in storage were at comparatively low levels until the last quarter of 1949. Poultry holdings increased sharply as turkeys moved into storage in significant amounts. Fowls also increased in large numbers and by December 1 about 268 million pounds of poultry were in storage.

Meats and Meat Products

Less meat and meat products were in storage during 1949 than a year earlier. Average first-of-the-month stocks amounted to 643 million pounds during 1949, whereas in the previous year the average was 733 million pounds. The most beef reported in storage during 1949 was 151 million pounds (February 1), about 25 million pounds less than last year. Pork holdings at the seasonal peak—611 million pounds—were 89 million pounds below the maximum reached in 1948. Lard and rendered pork fat in storage fell off sharply during the last half of 1949 when compared with the stocks of a year earlier. During this period (July-December) monthly stocks were about half the stocks of lard and rendered pork fat reported in storage for the comparable period in 1948.

No Price Support on 1950 Production of Chickens and Turkeys

THE Production and Marketing Administration of the U. S. Department of Agriculture has announced that there will be no price support program on 1950 production of chickens (including commercial broilers) and turkeys. The announcement is being made at this time so as to enable chicken and turkey producers to take this factor into consideration in their plans for 1950 production.

Price support for chickens and turkeys is not mandatory under the provisions of the Agricultural Act of 1949. In determining whether a price-support operation shall be undertaken, the Secretary is directed to consider a number of factors, among them the perishability of the commodity, the importance of the commodity to agriculture and the national economy, and the ability of the Department to dispose of stocks acquired through a price-support operation.

Department officials pointed out that it is still early enough in the season for producers to make any adjustments in their individual production operations that may be warranted by the announcement.

Although the Department was obligated to support prices of chickens (excluding commercial broilers) and turkeys at varying levels from 1942 until this year, it has been necessary to carry out purchase programs for these commodities on only a few occasions.

Support programs for chickens were announced in 1946 and 1947, but no purchases were actually required. Four turkey price support programs have been announced, with purchase operations required under only two of them. About 1.5 million pounds acquired under the 1947 program were later sold to the Armed Forces. Under the 1949 program about 9 million pounds have been bought so far this season. The Department is obligated to make further purchases of 1949-crop turkeys still in storage in July 1950. The bulk of the turkeys so far acquired have been transferred for use in school lunch programs.

Cold Storage Holdings–Trend Toward Normal Occupancy Indicated

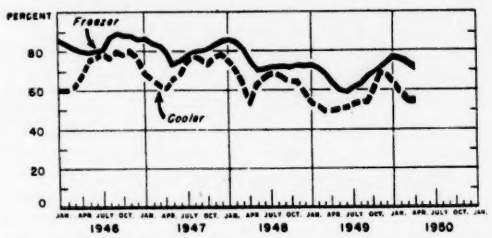
COOLER space in public warehouses was 54 percent occupied on April 1—one point below the previous month's occupancy. Although 6 points below average for this time of year, cooler occupancy was nevertheless 6 points above the occupancy of a year ago. Increased utilization of cooler space was reported in the East and West North Central, South Atlantic, East South Central, and Mountain regions. The largest gains in space occupied in the West North Central and Mountain regions where respective increases of 5 to 9 points were reported.

TABLE I—COLD STORAGE HOLDINGS IN PUBLIC, PRIVATE AND SEMI-PRIVATE WAREHOUSES, APPLE HOUSES AND MEAT PACKING PLANTS (000 LBS.)

	April 1, 1950	March 1, 1950	April 1, 1949	Five-year Average
Meat and meat products, lbs.	779,845	815,578	860,785	761,953
Lard and rendered pork fat, lbs.	87,900	81,174	156,782	105,046
Frozen poultry, lbs.	212,678	260,523	108,732	203,739
Creamery butter, lbs.	94,178	92,886	6,318	12,475
American cheese, lbs.	143,303	149,004	105,608	88,204
Other cheese, lbs.	13,567	11,912	12,802	12,886
Shell eggs, cases	1,253	735	530	1,552
Frozen eggs, lbs.	115,320	73,159	77,319	116,763
Apples, bu.	7,120	12,502	5,491	7,685
Frozen fruits, lbs.	254,619	265,204	266,581	286,182
Frozen vegetables, lbs.	269,653	305,316	206,061	185,229
Frozen fish, lbs.	86,947	105,818	82,722	72,360

Freezer space, down 4 points since March 1, was 70 percent occupied on April 1. This compares with an average occupancy for this time of year of 73 percent and last year's April occupancy of 64 percent. In all areas except the Middle Atlantic, West South Central, and Pacific regions, freezer occupancy was greater than the national average of 70 percent. In key cities public cooler occupancy was unchanged from last month, but utilization of freezer space was down 5 points. Minneapolis and St. Louis warehousemen reported that more than 85 percent of their cooler space was being used while greater than 85 percent utilization of freezer space was reported in Minneapolis, Kansas City, and Nashville.

The total weight of all foodstuffs held under refrigeration on April 1 exceeded the five-year average first-of-the-month holdings by 151 million pounds. The 1.6 billion pounds in freezers and 1.4 billion pounds in coolers compares with average freezer and cooler weights, for this time of year, of 1.4 and 1.5 billion pounds, respectively. Except for butter, frozen eggs, sausage, and lard, which increased since last month, significant net withdrawals of other



freezer stored commodities reduced the total freezer weight by 6 percent from a month earlier. In accordance with the seasonal pattern, cooler weights decreased at a much faster rate than freezers during March, as fresh fruits, vegetables, cheese, and pork moved from store.

TABLE II—PERCENTAGE OF SPACE OCCUPIED BY PUBLIC COLD STORAGE WAREHOUSES (APPLE HOUSES EXCLUDED)

	Net Piling Space (000 cu. ft.)		Apr. 1, 1950 (%)		March 1, 1950 (%)		April 1, 1949 (%)		5-Year Average (%)	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	2,702	5,100	43	75	52	79	37	63	60	63
Middle Atlantic	37,943	28,754	44	65	49	72	40	59	77	76
East North Central	29,479	28,869	60	71	59	75	51	64	60	73
West North Central	9,756	14,575	78	82	73	84	54	74	64	74
South Atlantic	8,596	5,523	56	71	55	76	50	79	65	82
East South Central	4,160	3,880	69	81	66	80	65	86	74	76
West South Central	6,698	6,389	59	60	60	58	73	57	70	70
Mountain	1,690	1,935	74	75	65	77	57	70	73	83
Pacific	15,830	19,725	47	63	48	68	44	55	57	66
United States	116,854	114,750	54	70	55	74	48	64	60	73

Frozen fruits on hand the first of this month were in lesser supply than a month ago. Except for fruit juices and purees, which increased by 19 million pounds since

TABLE III—PERCENTAGE OF SPACE OCCUPIED BY PRIVATE AND SEMI-PRIVATE REFRIGERATED WAREHOUSES AND MEAT PACKING PLANTS (APPLE HOUSES EXCLUDED)

	Private and Semi-Private Warehouses						Meat Packing Establishments					
	Net Piling Space (000 Cu. Ft.)		Space Occupied—Per Cent April 1, 1950		Space Occupied—Per Cent March 1, 1950		Net Piling Space (000 Cu. Ft.)		Space Occupied April 1, 1950		Space Occupied March 1, 1950	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	85	112	31	71	49	73						
Middle Atlantic	1,519	1,219	42	74	44	76	1,371	239	83	81	88	85
East North Central	2,777	1,546	67	41	70	46	4,617	1,493	90	61	87	88
West North Central	674	1,998	99	83	89	82	13,886	6,065	89	86	93	90
South Atlantic	119	877		27	33	43	1,372	242	85	98	84	98
East South Central							403	100	92	92	93	94
West South Central	202	31	42	16	42	16	2,840	520	98	97	100	100
Mountain	117	38	89	76	90	79	608	383	91	99	90	99
Pacific	2,862	2,911	18	53	25	62	2,835	589	92	97	93	97
United States	8,355	8,732	47	58	49	64	27,932	9,631	90	84	91	91

NOTE: Blank spaces indicate that insufficient returns were received.

March 1, stocks of all frozen fruit items on hand April 1 reflected net withdrawals during March. The net reduction of 11 million pounds of frozen fruit stocks left 255 million pounds in storage as compared with 267 million pounds in storage a year ago. These withdrawals during the month, however, were about a third the average March to April change and the change a year ago.

Frozen vegetables, on the other hand, were withdrawn from storage in greater than average amounts. The 270 million pounds in storage on April 1 reflected a net reduction of 36 million pounds since March 1. This compares to an average net change of 21 million pounds. The most significant change in storage holdings was noted in stocks of green peas, lima beans, snap beans, and sweet corn. Net withdrawals of these four vegetable items accounted for more than four-fifths of the net reduction in total frozen vegetable holdings, but at the same time their weight in storage represented more than half of the total frozen vegetables on hand April 1.

At no time since records were first kept has there been as much butter in storage on April 1 as was reported this year. First-of-the-month stocks totaled 94 million pounds, an increase of approximately 1 million pounds since last month. Government-owned butter, however, totaled 80 million pounds of this total. Cold storages in the East and West North Central regions held 39 and 38 million pounds, respectively, or about four-fifths of the national holdings. Total cheese stocks were down to 160 million pounds by April 1, a reduction of 4 million pounds from a month earlier. Of the total in storage, American cheese amounted to 143 million pounds, which was the second largest amount in storage on April 1 since 1916; on April 1, 1942, 166 million pounds were in storage.

Shell eggs continued to move into storage at a faster rate than last year but not as rapidly as normally expected. During March, 518 thousand cases of shell eggs moved into storage throughout the Nation thereby bringing April 1 holdings to about 1.3 million cases. Storages in the East North Central region, with 561 thousand cases on hand April 1, had more shell eggs than warehouses elsewhere in the Nation. In the Middle Atlantic region, the second largest storer of shell eggs, there were only 202 thousand cases.

Greater than average amounts of frozen eggs moving into storage during March raised total stocks on hand April 1 to 115 million pounds. Stocks of frozen eggs in storage, however, were about average for this time of year but exceeded last year's holdings by 38 million pounds.

Frozen poultry stocks were down to 213 million pounds by April 1. The net reduction during March of 48 million pounds was a fifth greater than average and was more than twice the net withdrawals of a year ago. Turkeys held in storage in the Middle Atlantic and Pacific regions were almost evenly divided with approximately 31 million pounds reported in each region on the first of the month.

April 1 holdings of frozen beef were the smallest amount on hand for this time of year since 1943. With only 91 million pounds in storage, current holdings were about two-thirds the average April 1 stocks. Frozen pork in storage was down to 317 million pounds on the first of this month as compared with an average of 250 million pounds reported on hand April 1 for the five-year period ended 1949. The total for all pork in storage, however, amounted to 547 million pounds. This compares with 586 million pounds in storage a year ago.

Frozen fishery products in storage on April 1 exceeded average first-of-the-month holdings and the stocks of a year ago. The 87 million pounds, on hand reflected a net reduction during March of 19 million pounds, most of which was accounted for by the reduction in stocks of shrimp, miscellaneous fillets, halibut, and whiting.

The April 1 cooler occupancy reported by public cold storage warehousemen should mark the end of the seasonal decline in cooler occupancy. This pattern has prevailed for the last 10 years with but one exception; in 1945 the seasonal low was reached on May 1. From now until November 1, a steady rise in cooler utilization is expected because of shell eggs, nuts, nutmeats, and selected meat items moving into storage. Normally, the occupancy increase from April to May is 2 to 3 points; however, should an increase of this magnitude not obtain during April, it could be explained in part by the less than average amounts of case eggs which have been moving into cooler storage. Freezer occupancy in public storages is still on the downward cycle and should continue to decline for another month at least. The decline in occupancy during the 5-year period ended 1949 from April to May averaged 4 points, which would place May 1, 1950 freezer occupancy at 66 percent or about 3 points below average. By comparison, on May 1, 1949, freezers were 14 points below their respective 5-year average occupancy.

Cold Storage Stocks of Frozen Fruits and Vegetables

ON MARCH 1 storage stocks of frozen peaches, raspberries, and strawberries amounted to 67 million pounds, of which 47 million pounds were classified by warehousemen as to container size. Holdings in packages of one pound or less amounted to 33 percent of the stocks classified. The ratio of consumer-sized packages to institutional containers has shown a slight decrease each month since December 1, 1949, when 37 percent of classified stocks were in retail packages. For individual items the proportion of strawberries and raspberries in consumer packages showed a decrease during February with strawberries going from 44 to 39 percent and raspberries from 21 to 19 percent. The portion of peaches in retail packages, however, increased from 41 to 46 percent.

Of the 202 million pounds of selected frozen vegetables in storage March 1, 58 percent were classified as to container size. Vegetables in retail containers amounted to 60 percent of the stocks classified. Since August of last year approximately 60 out of 100 pounds of frozen vegetables reported as to package size were in containers of one pound or less, with the exception of October, when the ratio was slightly lower. The proportion of spinach in retail containers has decreased since December 1949, when 83 percent of spinach stocks were in the smaller containers. On March 1 retail packages of spinach amounted to 78 percent of classified spinach holdings. Stocks of lima beans and sweet corn in consumer packages remained proportionately the same as last month. The ratio of consumer to institutional-sized containers for asparagus and lima beans decreased, however, frozen peas in one-pound packages were proportionately greater on March 1 than during the previous month.

COLD STORAGE STOCKS OF FROZEN FRUITS AND VEGETABLES IN PACKAGES OF ONE POUND OR LESS IN STORAGE MARCH 1, 1950 AND FEBRUARY 1, 1950 (000 LBS.)

	March 1, 1950		February 1, 1950	
	Lbs.	Pct.	Lbs.	Pct.
Peaches	4,982	46	5,060	41
Raspberries	3,355	19	4,326	21
Strawberries	7,298	39	11,105	44
Asparagus	1,610	67	2,381	70
Beans, lima	15,806	59	17,896	59
Beans, snap	12,856	69	15,222	70
Corn, sweet	8,475	46	9,494	46
Peas, green	22,024	57	26,197	55
Spinach	10,172	78	12,649	80

Frozen Foods
Reg. U. S. Patent Office
COVERING EVERY PHASE OF THE QUICK FREEZING OF PERISHABLE FOODS—PREPARATION, PACKAGING, FREEZING, STORAGE, DISTRIBUTION, DESIGN, CONSTRUCTION, EQUIPMENT, OPERATION OF LOCKER PLANTS.

Dehydrofreezing Offers New Advance In Technique of Food Freezing

FURTHER advances in the process of dehydrofreezing have been made recently at the Western Regional Laboratory of the U. S. Department of Agriculture at Albany, Calif. The developments are described in the annual report of the Secretary of Agriculture, along with other advances in food freezing techniques. The dehydrofreezing method involves partial dehydration of fruits and vegetables to reduce their weight, followed by conventional freezing. The potential economic advantage of the process over ordinary freezing lies in lower costs of transporting, packaging the storing the finished product.

Drying Time Reduced

It is generally recognized that most of the quality impairment associated with conventially dehydrated foods occurs during the final stages of the dehydration. Dehydrofreezing avoids this final stage of drying. Furthermore, the drying time for dehydrofreezing is generally less than an hour, a small fraction of the time required for conventional dehydration. In dehydrofreezing, volume and weight reductions are almost as great as in conventional dehydration and amount to approximately 50 percent. Hence, a dehydrofreezing yields products with quality comparable to that resulting from freezing preservation, but with substantial reduction in storage and transportation costs.

Considerable development work has been done in applying dehydrofreezing to various fruits and vegetables. Early experiments yielded encouraging preliminary results with peas, carrots, potatoes, apricots, cherries, and boysenberries. Following this preliminary work, comprehensive experiments were carried out on the nature of both process and product. Those experiments included studies to (1) develop satisfactory preprocessing treatments such as steam blanching and sulfiting, (2) determine optimum drying conditions, (3) investigate the storage characteristics of the product, and (4) find which varieties were most adaptable to the process.

In the course of the work on peas, it was found that drying could be carried to the extent of about 50 percent weight reduction, based on the weight of raw shelled peas, without significant change in quality of cooked product. Thus dehydrofrozen peas of 50 percent weight reduction are comparable in taste, color and texture to control samples of conventionally frozen peas. Based on chemical determinations on cooked samples, the nutritional value of dehydrofrozen peas is also equivalent to that of comparable samples conventionally frozen.

Application to Apples

Application of dehydrofreezing to apples is of particular interest, because the dehydrofrozen product appears superior in certain important respects to its conventionally frozen counterpart. Thawing of dehydrofrozen apples presents no problem, as this can be brought about immediately upon addition of the hot water needed for reconstitution. The problem of "drip" during thawing is non-existent for dehydrofrozen apples, and thus packaging is greatly simplified. When cooked in pie dehydrofrozen apples show texture characteristics superior to comparable samples of frozen apples, owing to lessened tendency to mush.

Showing how dehydrofreezing reduces volume of sliced apples. Left, freezer; right, dehydrofreezing.

"Syrup filling" of apples for freezing, another process recently developed at the Western Laboratory, is said to prevent browning of apple slices after freezing and makes them superior in flavor, texture and "drip" characteristics to the conventionally prepared product. This treatment is reported particularly useful for soft textured apple varieties used in pies. Another development cited in the report

is experimentation with indirect-immersion freezing. Researchers describe this as a safe as well as speedy and economical method of food preservation.

More extensive work with apricots has shown that they also yield an excellent dehydrofrozen product. Present consumption of apricots for use in pies and pastries is known to be much lower in the eastern part of the United States than in the western. The opinion of many in the baking industry is that consumption of apricots could be greatly increased by the introduction of this new product.

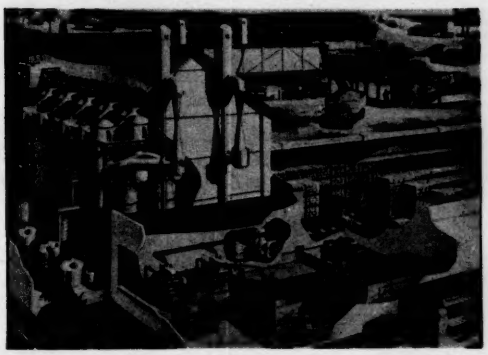
The process is several times as fast as conventional air-blast package freezing and appreciably faster than the more expensive plate process. In indirect immersion freezing, food products are packed in hermetically-sealed containers and then immersed in a refrigerated liquid until frozen.

On the basis of results of work on dehydrofreezing, it appears entirely reasonable to conclude that several kinds of fruits and vegetables can be dehydrofrozen to yield products of excellent quality and convenience. Reliable cost estimates await tests of the process on a pilot-plant scale, but it appears to be certain that savings in packaging, storage, and transportation costs will more than offset the relatively small cost of partial dehydration.

Work to obtain data required for designing commercial immersion-freezing equipment is continuing at the laboratory. This is expected to help open the way for wide application of the process to the frozen food industry.

Frozen Orange Concentrate Process Described in Advertisement

THE importance of the refrigeration industry in the development of new food freezing processes is typified by the phenomenal success of canned frozen concentrated orange juice. The new freezing processes depend to a large extent upon the use of extreme temperatures and their careful control.



Enlargements of the above cutaway view of a frozen orange juice plant are being offered to members of industry and the general public by the Armstrong Cork Co. The view was presented in a full-color page advertisement in the May 6 issue of The Saturday Evening Post. Cooperating with Armstrong in the preparation of the presentation was the National Association of Frozen Food Packers. The enlargements, 21x22 inches, in full color suitable for framing, may be obtained by writing to the Armstrong Cork Co., Lancaster, Pa.

Developments in the frozen concentrated food field have come rapidly. Most of the story of the careful and regulated processes which make such advances possible is little known to the general public. Public knowledge of the behind-the-scenes activity of producing frozen concentrated orange juice has been furthered by the publication of a full-color advertisement entitled "How Frozen Orange Juice Is Made" in The Saturday Evening Post of May 6.

One of the features of the presentation is the cutaway view of a typical frozen orange juice plant. The illustration and accompanying editorial explanation briefly tells readers how frozen concentrated orange juice is produced. The copy of the advertisement reads in part:

"Frozen concentrated orange juice is made by a fascinating new process that removes water without affecting taste or vitamins. Its success has been so startling that the idea is spreading to grapefruit, lemon, and other fruit juices.

"To work properly, this new process, like so many others, depends upon extremes of temperature. Big trucks deliver the ripened fruit. After it is washed, the fruit moves by conveyors to huge juice extractors. Most of the juice has its pulp removed by filters. The pulp is combined with a small percentage of fresh juice and cooled in tanks covered with insulation to keep heat out.

"Meanwhile, the filtered juice travels through tall columns where a vacuum is created by a jet of high pressure steam. Because of the vacuum, the juice boils at only 55 F. instead of the usual 212 F. That's why the juice is not discolored and vitamins and taste are not damaged.

"Next, this concentrated juice is combined with the precooled mixture of pulp and unprocessed fresh juice and is partially frozen. After it's sealed in cans, the juice is quick-frozen at 40 F below zero. From the zero-cold warehouse, cartons are shipped out in refrigerated trucks."

Investigate Shortage of Refrigerated Transport for Concentrates

THE Interstate Commerce Commission has launched a full-scale investigation of whether or not the nation's railroads have enough low-temperature refrigerator cars to meet the needs of the fast-growing frozen citrus juice concentrate industry in Florida. Pending the outcome of the investigation, the Commission has forbidden operators of refrigerated truck-trailers to buy any new equipment over and above that already in operation. It has also ordered them to restrict their service to trucks providing heavy-duty, low-temperature mechanical refrigeration with not less than six inches of insulation.

When the juice industry in Florida started its amazing growth over the past 12 months, processors found there were not enough refrigerator cars available from the railroads to meet all peak needs, or to reach certain processing centers and warehouses. So the I.C.C. issued to several truck lines "temporary certificates" of convenience and necessity permitting them to haul the concentrates in refrigerated trucks. Such "temporary certificates" can be issued and held in effect only when "existing facilities" are found to be inadequate.

The I.C.C. held a series of hearings in Florida recently to determine whether or not some of the temporary authority should be revoked, so that railroads would get a larger portion of the juice concentrate business. Railroad experts gave testimony showing the substantial investment of the roads themselves and their car-building agencies in new refrigerator cars. They contended this investment would be jeopardized if truckers were permitted to compete permanently with the rail lines on a broad scale. On the other hand, several juice processors testified they were satisfied with refrigerated truck service, that they felt it was a needed supplement to rail service, and that they thought they should be permitted to use "rounded transport facilities"—both rail and truck.

The I.C.C. requested all parties to furnish detailed information, and took the issue under advisement. A major question before the Commission is whether all the truck lines now holding temporary certificates should be granted permanent authority to haul frozen foods.

The Florida Citrus Commission has put up a committee to study the question and furnish detailed data to the I.C.C.

Reduced Truck Rates Prohibited

A temporary suspension order has been issued by I.C.C. prohibiting several motor truck lines from reducing their rates for hauling frozen citrus juice concentrates from various points in Florida to Jacksonville. The suspension was made in mid-April and will be effective for the next seven months, while the I.C.C. studies the suggested new rate schedules and investigates complaints from railroads about the cuts. Members of the Southern Motor Carriers' Rate Conference, with headquarters in Atlanta, Ga., had proposed reductions in the cost of hauling the juice concentrates within Florida that would have just about cut in half the present truck tariffs.

The Atlantic Coast Line Railroad and the Seabord Airline Railroad objected to the proposed cuts and petitioned the I.C.C. to keep them from taking effect. The Commission then issued its temporary suspension order pending an investigation. The suspension will be effective until November 9, 1950.

The truckers, in addition to the rate cuts, had planned to raise their minimum refrigerated truck loads from 20,000 pounds to 36,000 pounds. The new schedules would have reduced from 85 cents a hundred pounds to 42 cents the rate for truck shipment of frozen juice concentrates from Clearwater to Jacksonville—a distance of 215 miles—and would have cut from 64 cents to 31 cents the rate between Ocala and Jacksonville, a 102-mile stretch.

A.S.H.V.E. To Meet in Philadelphia

THE 57th annual meeting of the American Society of Heating and Ventilating Engineers will be held in Philadelphia the week of January 22-26 in Philadelphia. Arrangements have been made with the Philadelphia Convention and Visitors Bureau to obtain a commitment of 5,000 rooms in Philadelphia hotels to house the "engineers of human comfort." Registration and technical sessions will be at the Bellevue-Stratford, and other functions will be held in the Benjamin Franklin and Warwick Hotels.

The 10th International Heating and Ventilating Exposition, sponsored by the A.S.H.V.E., will be held simultaneously, during the week. The meeting will end on the 25th and the exposition on the 26th. The exposition will occupy all of the Commercial Museum, the Exposition Hall of the Auditorium and the intervening space. Charles F. Roth, manager of the International Exposition Co., which will put on the show, estimates that there will be between 325 and 350 exhibitors. Nearly 90 percent of the space has already been reserved.

Committee on Research

The appointment of Robert C. Cross, assistant manager of Merchandise laboratories, Sears, Roebuck & Co., Chicago, as chairman, and Richard S. Dill, chief, Heating and Air Conditioning Section, National Bureau of Standards, as vice chairman of the Committee on Research of the American Society of Heating and Ventilating Engineers has been announced by Lester T. Avery, president of the society. The Committee on Research plans and supervises the A.S.H.V.E. research program at its laboratory in Cleveland and at cooperating colleges and universities where the society has made a grant of funds.

Approved by the Council, supreme governing body of the society, the appointments were made by Mr. Avery, president of the Avery Engineering Company of Cleveland. The A.S.H.V.E. is the only professional engineering organization in this country that maintains and operates its own research laboratory. Its research work is confined to the determination of the basic or fundamental principles or laws underlying all matters in the science of heating, ventilating and air conditioning.

In carrying out its work, the 15-man Committee on Research is assisted by 18 technical advisory committees which act in an advisory capacity to the committee and to the A.S.H.V.E's Director of Research, Cyril Tasker.

New York City Restricts Use of Water for Refrigerating Units

RESTRICTIONS on nearly all New York City air-conditioning and refrigeration units using non-recirculating water were issued March 23 by City Water Commissioner Stephen J. Carney, who termed the move "the most important single permanent conservation measure to date." The new ruling on air-conditioning and refrigeration units extended to existing units the limitations imposed last December for newly installed units in the city. It was estimated that 175,000,000 to 200,000,000 gallons of water a day will be saved through these restrictions.

The order directs that all air-conditioning and refrigeration equipment not meeting the rules laid down last December for new units "shall be shut off if not so conforming by June 1, 1950." As explained by Ormonde J. Burke, chief of the City Bureau of Water Register, the rules limit non-circulating systems to units of three tons or less. A three-ton unit uses five gallons of water a minute.

Heretofore, in New York City, units up to 25 tons, using 50 gallons a minute were permitted to be non-recirculating. Last December's rules were not made retroactive at the time. Burke estimated that the restrictions on existing equipment would affect from 14,000 to 18,000 air-conditioning units and 10,000 refrigeration units.

Explaining that changing air-conditioning and refrigerating equipment from non-conforming to conforming types was comparatively simple, Burke said his office already had been notified that widespread conversion was under way.

Railroad Completes Ice Harvest

THE annual ice-harvesting of the New York Central Railroad at Carthage, N. Y., has ceased after 8,500 tons of ice were harvested this year. The amount was 500 tons over the top estimate of 8,000 tons which railroad officials predicted earlier would be cut. It was, however, 3,500 tons below the amount cut here last year. Work on the Black River ended after 20 continuous days of operation. A crew of approximately 45 men were employed under the supervision of John W. Scott, foreman.

The ice was carried from the scene of operations to the storage house at Richland, where all except about 1,000 tons were stored. The rest went to the Pennsylvania division of the railroad in 282 railroad cars. Mr. Scott said that he did not remember that ice had ever been cut as late as March 21. Because of warm January weather it was not thick enough on the river to commence harvesting until March 2.

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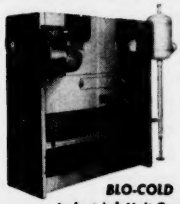
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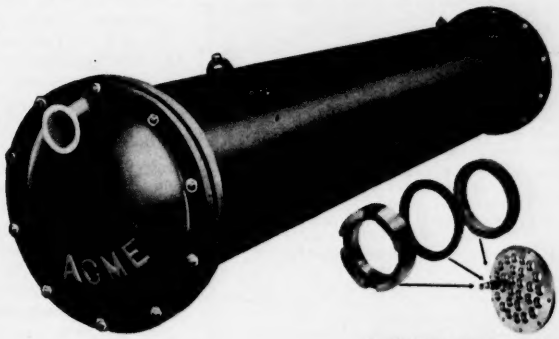

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ASRE Spring Meeting to be Held at Kansas City, June 4-7, 1950

KANSAS City's Hotel Muehlebach will be headquarters from June 4 to 7, 1950, for the 37th spring meeting of the American Society of Refrigerating Engineers. Following the custom of the Society the spring meeting will be devoted to the presentation of technical papers on refrigerating subjects and, in addition, two engineering conferences on specialized problems of the industry will be held.

The meeting dates almost coincide with the start of the elaborate Hundredth Anniversary Celebration of Kansas City and it is expected that many A.S.R.E. members will come to the city a day or two before the meeting starts to combine business with pleasure. The city will take on a festive air on June 3 as parades, a gigantic industrial show with "live" exhibits, a water ballet, and other entertainment is staged by the Kansas City populace to open a month's birthday celebration.

Technical and Engineering Sessions

Tentative plans for the A.S.R.E. meeting call for two technical sessions at which papers on such subjects as the testing and balancing of air conditioning systems, low temperature air conditioning, applications of a new refrigerant, refrigerated truck transportation, the prepackaging of meats for retail sale, and others will be presented.

In addition to the regular technical sessions two engineering conferences will be held. One of these will be the domestic refrigerator conference, which has proved so popular at recent meetings of the Society, and which will feature application of insulation to household refrigerators and home freezers. The other conference will be on the timely subject of water re-use. The conferences differ from the usual technical meeting sessions in that formality is abandoned and the engineers in attendance discuss in round table fashion the particular problems under discussion.

Social Functions

Social functions will include inspection and sightseeing trips, a welcome luncheon and speaker, an informal "Roundup" party, and the traditional A.S.R.E. dinner-dance on the final night of the meeting. The Society's Council will meet on Wednesday, the last day of the meeting. A number of meetings of the various technical committees of the Society are scheduled on Monday and Tuesday. The meeting of the section chairman will be held on Sunday before the spring meeting officially gets under way.

Arthur J. Hess of Los Angeles will be in charge of the technical program. M. W. Pehl of Kansas City is chairman of the convention committee and will arrange the social program. The Kansas City Section of A.S.R.E. will act as host for the meeting.

Technical Program

A tentative program for the technical sessions has been announced as follows:

Low Temperature Air Conditioning by W. L. Holladay, Hieatt Engineering Co.;

Testing and Balancing Air Conditioning Systems by Fritz Honerkamp, Anemostat Corp. of America;

A New Refrigerant, Carrene-7 by Carl M. Ashley, Carrier Corp.

Refrigerated Truck Transportation by an engineer of U. S. Thermo Control Co.;

Precooling and Rail Shipment of Fruits and Vegetables by an engineer of Preco Inc.;

Processing of Package Meats for Self-Service in Retail Stores by Jack Dickey, Hussmann Refrigerator Co.

These papers will be delivered at sessions to be held Monday afternoon and Wednesday morning.

Chicago Section, A.S.R.E.

THE March meeting of the American Society of Refrigerating Engineers was held at the Builder's Club, Chicago, Thursday evening, March 9. Featured speaker was Kenneth Newcum, president of Remco, Inc.

Mr. Newcum said that most refrigeration dehydrators have been installed in the least efficient location in the system. He explained that the usual small refrigeration system has the dryer installed in the liquid line where it leaves the condensing unit. If the unit is located in a warm equipment room, this results in the desiccant (be it silica-gel, calcium-chloride or whatever) having to extract moisture from the refrigerant at the highest temperature point in the system where the refrigerant has its greatest affinity for moisture.

Since a dehydrator is largely a temporary device, service men are reluctant to depart from past practices. Obviously, however, if the dryer could be located within the cooled space, or better yet in the suction line itself, it could get at more free moisture. This practice was recommended by Mr. Newcum, who cautioned also on the importance of maintaining adequate areas for free flow. He went on to explain that mechanical dryers were first used with methyl-chloride, a high latent refrigerant, and that many changes have had to be made since the advent of freon, which requires the circulation of about 2½ times as much gas for an equal amount of refrigeration effect.

In recent years, chemical dehydrators have been developed, utilizing the principal of absorbtion as well as adsorbtion. One of the best of these is calcium-sulphate, which has the property of combining chemically with water and holding up to 6.6 percent of its weight in water absorbed.

British Institute of Refrigeration Observes 50th Anniversary

THE Institute of Refrigeration of Great Britain held its golden jubilee at the Savoy Hotel, London, February 1, 1950, although the 50th anniversary officially fell on December 8, 1949. It was a memorable occasion for 400 members and guests who shared in it. Under the chairmanship of Viscount Bruce of Melbourne, C. H., M. C., F. R. S., president of the Institute, the audience listened to a full quota of speeches that were brilliant, humorous and succinct, according to the report of the celebration published in Modern Refrigeration.

The Institute was organized December 8, 1899 at a meeting held at the Chamber of Commerce, London, arranged by R. M. Leonard, editor of Cold Storage, now Modern Refrigeration. The name "Cold Storage and Ice Association" was adopted and this title was retained until 1922 when it was changed to the "British Cold Storage and Ice Association." In 1927 it was changed to the British Association of Refrigeration and this name was retained until 1943 when it became known as the Institute of Refrigeration. The Hon. Alan de Tatton Egerton, M.P., afterwards Lord Egerton of Tatton was the first president.

A.C.R.M.A. Adds to Board of Directors

THE Air Conditioning and Refrigerating Machinery Association has announced the election of T. E. Smith of Westinghouse Electric Corp., Boston Mass., F. W. Smith of Baker Refrigeration Corp., South Windham, Me., and T. E. Hoye of the Savage Arms Corporation, Utica, N. Y., to its Board of Directors.

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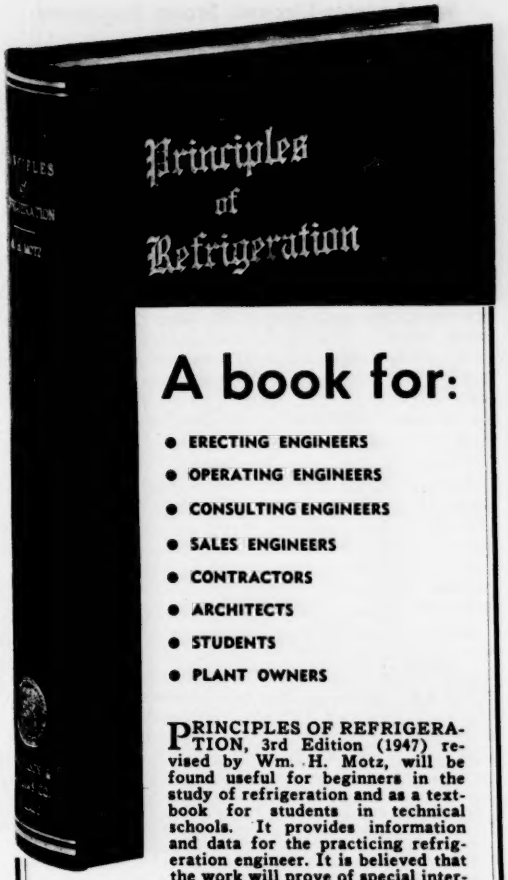

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- SALES ENGINEERS
- CONTRACTORS
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- STUDENTS
- PLANT OWNERS

PRINCIPLES OF REFRIGERATION, 3rd Edition (1947) revised by Wm. H. Motz, will be found useful for beginners in the study of refrigeration and as a textbook for students in technical schools. It provides information and data for the practicing refrigeration engineer. It is believed that the work will prove of special interest to erecting and operating refrigerating engineers, refrigeration machinery sales engineers, persons employed in building refrigerating machinery and those employed in ice making, cold storage plants or other establishments equipped with refrigerating machinery. In general the work contains information that is necessary the refrigerating engineer should know in order that he may have complete and up-to-date knowledge of the theory and practice in this field of endeavor.

The work is in every day language and as free as possible from higher mathematics. The method of treatment has been to present a comprehensive treatise on the fundamental principles. With a firm grounding of these fundamental principles the practitioner is enabled to intelligently design or operate refrigerating machinery. The theoretical and fundamental operating principles are given attention first. This is followed by numerous practical considerations and the application of the fundamental principles to the economic production of ice and refrigeration for various purposes.

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Los Angeles Licenses Steam Engineers

A NEW license law went into effect in February in the city of Los Angeles which concerns all operating steam engineers and will in all probability, to some extent, effect operating refrigerating engineers and mechanics.

For some years the California Institute of Power Engineers had been active in preparing an ordinance designed to eliminate the inequalities of a one grade license. No real progress was made, however, until 1949, when the Los Angeles Board of Mechanical Engineers was merged with the Municipal Board of Building and Safety Commissioners.

Numerous meetings were held by the board last year and during the early part of this year. Members of the CIPE, which is composed of delegates from six chapters of Southern California power and refrigerating groups, were invited to appear at those meetings to cite experiences and offer recommendations for a contemplated code. An advisory committee of members of the CIPE was formed to collaborate with the board in arriving at a standard rating of boiler horsepower.

The determination of boiler horsepower was ultimately settled by allowing recourse to two alternate methods of evaluation. One method is based on heat value of fuel, and fuel consumed per hour, which is expected to be the method of calculation generally used. The other method is based on the established practice of the evaporation of 34½ lbs. of water per hour from and at 212 F.

Although the Institute of Power Engineers based 5 cubic feet of natural gas per minute to be rated at 5 hp, the Board adopted 7 cubic feet consumed per minute as the basis for 5 hp. and the new law incorporates that figure. Under the new law, any steam generating plant which consumes more than 49 cubic feet per minute is rated at more than 35 hp. The establishment of a method of boiler rating was regarded as particularly important in relationship to the graded licenses provided for in the new ordinance.

Types of Licenses

Three types of licenses are called for under the new law.

1. A limited license for operation of a steam boiler or steam generating apparatus carrying over 15 lbs. per square inch pressure and rated not to exceed 35 hp. This type of license is subject to the following restrictions: (a) It applies only to specified equipment. (b) It is issued only to the owner of the boiler or to a responsible person assigned by him to boiler operation. (c) An examination for license is required, with examination fee set at $2.00 and renewal fee at $1.00.

2. This type of license, designated as No. 2, is a limited license for steam engineers to operate steam boiler or steam generating equipment carrying over 15 lbs. pressure per square inch and rated not to exceed 300 hp. An examination also is required in this instance, with fees similar to the above.

3. The new ordinance provides for a third type of license in the form of an unrestricted license issuable to any person who passes a qualifying examination covering all phases of power plant operation.

Under the new ordinance, the status of a one-grade steam engineers license in effect when the law went into effect will continue at full value unless it is allowed to lapse. An examination will be required before a renewal is issued after lapsing. The California Institute of Power Engineers, which helped draw up the new licensing code, is a committee composed of delegates representing various Southern California power and refrigerating groups.

Book Review

HEAT PUMP APPLICATIONS, by Emory N. Kemler, associate director Southwest Research Institute and Sabert Oglesby, Jr., instructor in electrical engineering, Purdue University. Published by McGraw Hill Book Co., New York. Illustrated, 310 pages. Price $6.00. For sale by Nickerson & Collins Co., Chicago.

This book offers in non-technical language a practical discussion of the application of the heat pump for industrial, residential and commercial purposes, including its operation, performance and potentialities. It is a summary of many contributions to the advancement of the heat pump and consolidates much of the information available in the literature on this subject as well as material developed by the authors and groups with whom they have been associated. Temperature and design data have been included, and liberal use has been made of illustrations. With this book those who are concerned with designing heating systems can reap the benefit of past developments in connection with heat pump installations. A final chapter gives a patent survey for those having a more technical interest in this subject.

Sales and Reorganizations

San Louis Obispo, Calif.—Sale of the Witcosky Meat Company to H. W. Dittlevsen, former Watsonville wholesale meat man and Irvin Bray, prominent King City cattle dealer, was announced recently. Frank Witcosky, from whom the business was purchased, will continue to be associated with the firm. The new owners plan to rename the company the San Luis Meat Company and to enlarge its operations.

Kenner, La.—The New Orleans Ice Delivery Corp. of New Orleans, has purchased the plant formerly occupied by the Trucker's Ice and Storage Co. Ltd., here, which is an electrically operated plant and measures 125 ft. by 250 ft. Price paid was not announced.

Corvallis, Ore.—The government has announced that it will lease a general purpose cold storage plant at Camp Adair near here. Available on a five-year lease, the facility includes 2234 sq. ft. of 40 degree space and cold storage space for 300 tons at 35 degrees and 700 tons at 10 degrees. Both ammonia and freon compressors are used. The plant is equipped with power and lighting circuits.

Seattle, Wash.—The Seattle Packing Company has purchased Frye & Co. and the Union Stockyards Company for approximately $1,000,000, it was recently announced. Frye & Co., pioneer Seattle firm was established in 1888 by the late Chas. H. Frye, and covers an area of approximately 14 acres in Seattle's industrial area.

Fires and Accidents

Belleville, Kans.—Damage estimated at $5,000 occurred at Belleville Ice Plant when flames swept the engine room. Origin of the fire which broke out during the noon hour hasn't been determined. The loss was partially covered by insurance.

Kansas City, Kans.—The Superior Ice and Coal Company's ice storage house and truck garage at 1920 Grove St. was damaged by fire estimated at $2,500. An overheated furnace was listed by firemen as the cause of the blaze.

New Incorporation

Waco, Tex.—The Viaduct Ice Co. was recently granted a charter of incorporation by the Secretary of State. The company was chartered with $1,000 capital stock by Ray W. Jones, Winnie Jones and Ray Louise Daly.

Icy Item

Tonawanda, N. Y.—A business name has been filed in the Erie County clerk's office for the Rose Ice Co., 145 Young St., by Walter B. Ostrander.

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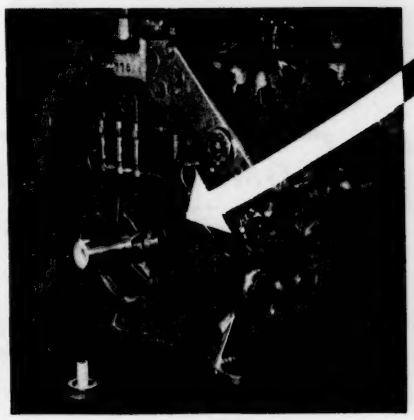

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Carrene-"7" New Refrigerant

DISCOVERY of a new refrigerant, called one of the most significant recent developments in the field, was reported recently to members of the American Institute of Chemical Engineers by two Syracuse scientists working on the research project for Carrier Corporation. The new refrigerant, known as Carrene-7, is expected to find widespread use in the air conditioning and refrigeration industry. Using the new refrigerant, it will be possible to do the same number of refrigeration jobs with fewer machines, and consequently will contribute to the general economy of the industry.

Carrene-7 possesses all of the desirable properties required for a safety refrigerant and also permits a reciprocating compressor charged with the new gas to produce a substantially greater refrigerating effect. The immediate result of this characteristic will be to increase the effective capacity of available reciprocating compressors, without requiring that they be redesigned. It was developed after six years of investigation carried out under the direction of Dr. William A. Pennington, chief chemist and metallurgist of Carrier Corporation, who was assisted in the work by Winston H. Reed, holder of a Carrier fellowship at Syracuse University.

The new refrigerant is a carefully proportioned mixture of two fluorinated hydrocarbone. It is what scientific circles term an azeotropic mixture, because it always boils at the same constant temperature corresponding to a particular pressure. Chemically it is composed of dichlorodifluoromethane (Freon-12) and unsymmetrical difluoroethane (Genetron-100).

The discovery came as a result of a search for a refrigerant which, when charged into a hermetic system designed for Freon-12 and 60-cycle power supply, would maintain the same capacity when 50-cycle power was used. Carrene-7 has been found to be an ideal solution to the 50-cycle problem since it gives almost exactly the same capacity with 50-cycle current as F-12 does with 60-cycle current, or a capacity about 18 per cent higher than F-12 where the same compressor is employed at the same speed. The pertinent research leading to the discovery of Carrene-7 was described by Pennington and Reed in a paper entitled "The Evolution of a New Refrigerant." Part of the paper was devoted to the development of criteria for judging and predicting the properties of promising refrigerants, thus avoiding the impractical task of investigating all of the 9,000 known single compounds.

With the realization that a single compound was not likely to be found, the scientists directed their study toward finding a mixture which would boil at a constant temperature while the pressure remained the same. An essential requirement was that the atmospheric boiling point be between -27.5 and -30.7 F, and it was finally discovered that Carrene-7 had a boiling point which fell within this range.

The authors reported that many factors, in addition to refrigeration capacity, were considered in the development of the new refrigerant. Among these were chemical stability, flammability, toxicity, effect on metallic and non-metallic materials used in refrigerating systems, and certain thermodynamic properties affecting performance. Carrene-7 satisfies all of the important requirements for a useful refrigerant. It is chemically stable, non-inflammable, physiologically safe, and does not attack or corrode the common materials of construction. Its cycle efficiency and other thermodynamic properties are very similar to Freon-12.

Limited applications have already been made, and plans are being formulated for broad commercial use.

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COMING CONVENTIONS

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M. C. TURPIN, Secretary

SOUTH CAROLINA ICE MANUFACTURERS ASSN.
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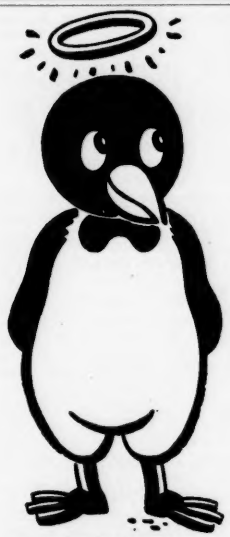

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NEW PLANTS AND IMPROVEMENTS

Information pertaining to proposed new plants utilizing refrigerating equipment, as well as additions, improvements, and rehabilitation of existing plants. News regarding such new plants and additions is invited for publication in this department.

ARIZONA

Phoenix, Ariz.—Worthington equipment consisting of two 4Hft Freon-12 compressor units, two ECZ-421 evaporative condensers, two Acme 20 ft. x 7 in. Dry X water coolers and two 2½D-4 monobloc pumps has been installed in the new $1,000,000 Phoenix terminal building of the Pacific Greyhound Lines.

CALIFORNIA

San Jose, Calif.—Modern Ice & Cold Storage Co., 1010 N. 13th. has started work on three additional cooler rooms with a total capacity of approximately 350,000 cubic feet. This new construction in addition to the one reported in March, 1950, ICE AND REFRIGERATION, will comprise an entire new building.

COLORADO

Denver, Colo.—In preparation for the 1950 season, Maddox Ice Co. here has installed two additional S & S ice vending stations. The units are equipped to dispense both block and prepared packaged ice.

CUBA

Havana, Cuba—Nueva Fabrica de Hielo, has installed a No. 370 Armstrong Purger manufactured by the Armstrong Machine Works. This Latin American company operates a 1000 ton refrigeration system.

CANADA

Cornwall, Ont.—Plans have been completed for construction of a $100,000 cold storage plant to be built on the Glebe Road on the northern outskirts of the city. It will be operated by Sormont Cold Storage Co-operative and will contain modern freezing equipment. The plant will be financed by government grants and by co-operative directors. A cold storage locker service will also be provided.

Montreal, Que.—St. Lawrence Artificial Ice recently incorporated at $80,000 capitalization, is converting a former brewery, installing ice-making equipment for early production. Owners of the company are Arthur Chevrier and A. G. Andrews. They are considering early expansion into refrigeration services.

IDAHO

Boise, Idaho—Fred York has been issued a building permit to erect a cold storage plant.

ILLINOIS

Chicago, Ill.—The International Harvester Co., is installing air conditioning in its office building consisting of three Worthington 6HF6 Freon-12 compressor units, one Worthington 30 in. x 12 ft. condenser, one Worthington-Acme 30 in. x 15 ft. Dry-Ex Chiller.

Pinckneyville, Ill.—Pinckneyville Ice Plant is undergoing a two-year $40,000 expansion and improvement program, according to Charles Boquillon, owner.

INDIANA

Evansville, Ind.—Ice Service Co. of this city has installed a Sturdy-Built automatic ice vending station, Model 20-C, equipped to dispense block ice and packaged ice in 10 and 25 lb. bags. F. B. Dickinson & Co. of Des Moines, Iowa, supplied the equipment.

KANSAS

Coldwater, Kans.—Two model 14 Polar vendors have been installed by the Golden Valley Locker Co.

Emporia, Kans.—Emporia Ice & Cold Storage has a model No. 20 Polar vendor in operation.

MISSOURI

Columbia, Mo.—A model 14-C Polar vendor for cake ice has been installed by the Columbia Ice & Cold Storage Co.

Kansas City, Mo.—Velvet Freeze Ice Cream Co., has installed a No. 370 Armstrong Purger with a thermostatic expansion valve, manufactured by the Armstrong Machine Works.

Ste. Genevieve, Mo.—Sexauer Bros. recently announced they will build a 15-ton ice plant with coin operated self-service facilities.

OHIO

Cincinnati, Ohio—Merchants Cold Storage Co., recently installed an Armstrong purger.

Dayton, Ohio—Terminal Cold Storage & Ice Co. has included a new Sturdy-Built ice vending station, Model 20C. in their preparations for the 1950 season. F. B. Dickinson & Co. of Des Moines, Iowa supplied the equipment.

PENNNSYLVANIA

Lewisburg, Pa.—The Ilgen Ice Co. here recently installed a model 20 Polar vendor.

RHODE ISLAND

Hamilton, R. I.—A corporation known as Alaskaland Industries has been formed for the purpose of establishing an $80,000 ice plant on the Boston Neck Road. The plant will have a 30-ton capacity with an ice-vending machine available 24 hours a day. With the completion of the ice plant, it is then planned to erect a $180,000 ice arena with a seating capacity of 2600. This will keep the ice-making business profitable 12 months of the year, according to Edward Schartner who is promoting the venture with his brother, John.

TENNESSEE

Clinton, Tenn.—Clinton Ice Co. is operating two Model No. 2212 Polar stations at Oak Ridge. Each station is equipped with two two-belt Polar vendors.

Memphis, Tenn.—Buckman Laboratories, Inc., have had a year-round panel cooling and heating system installed, using copper pipe in ceiling. Worthington equipment utilized is one 3HF4 Freon-12 compressor unit, one ECZ-102 evaporative condenser and one WUW-75 condensing unit.

TEXAS

Austin, Tex.—State of Texas Highway Department building has been air-conditioned with Worthington Pump & Machinery Co. equipment consisting of one 47C44 centrifugal refrigeration system with gear, 250 hp motor and controller.

Dallas, Tex.—With completed administration building, Alford Refrigerated Warehouses, a 6 million dollar project, is now functioning with its full capacity.

Llano, Tex.—The Llano Ice Co. is operating a JB2-12 Polar Junior station with vendors here.

Marlin, Tex.—Marlin Ice Co. here has two model 18B Polar combination vendors. Also the Southwestern Electric Service Co., has purchased a No. 14 two belt Polar vendor for their branch here.

Rotan, Tex.—Leon Ice Co. has a No. 1810 Polar station with three vendors.

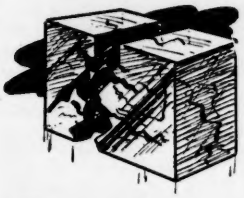
WASHINGTON

Seattle, Wash.—Ranier Ice & Cold Storage Co. last month placed in operation three additional S & S vending stations, Model 20-B.

Spokane, Wash.—The Desert Hotel here has had air conditioning installed in its cocktail lounge. The equipment consists of one Worthington 4HF6 Freon-12 condensing unit.

Temper Raw Water Ice the B-P way

TEMPLETS reduce the tendency of ice to crack and shatter. Water freezes faster with lower brine tank temperatures. Thus more ice can be produced in the same number of cans to meet the large demands of the summer season.

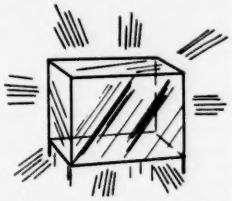


Breakage, checking and cracking may reduce your profit per ton on raw water ice. Improve your ice and increase profits with the use of TEMPLETS.

TEMPLETS dissolve quickly in the can water and go into action immediately to prevent the development of strain which produces brittle ice that is so difficult to handle.

TEMPLETS temper the ice and give it strength against bothersome bad breaks during scoring and cutting operations.

Two or more Templets in each can will produce that pleasing appearance and polish to your ice. Treatment by the B-P method costs less than loss through breakage.



Users want clear ice with a clean attractive sparkle and polish. TEMPLETS aid you in eliminating the cloudy veil, white butts and heavy cores which impair clarity of the ice block and any sized ice made from it, all of which means more profit for you at a cost of about 1c per ton of ice produced.

TEMPLETS are being used in Ice Plants Throughout the United States and in many Foreign Countries.

Write today for details and a trial sample. Your customers will thank you.

BARADA & PAGE, Inc.
GUINOTTE and MICHIGAN AVES.
Kansas City 1 Missouri

*PATENTED

New Condenser Cuts Refrigeration Costs Saves Cooling Water

● The Niagara Aeropass Condenser cuts the cost of refrigeration by running compressors at lower head pressure, saving up to 35% of power.

The refrigerant gas passes thru two coils in an air stream. The first, "Duo-Pass"* dry coil, removes the superheat by air cooling and condenses oil vapor. The second, condensing coil, drenched by recirculated water spray, condenses by evaporation, transferring to the air 1,000 BTU for every pound of water evaporated and saving more than 95% of the water used by water-cooled condensers. This done at low temperature, no scale forms on condenser tubes to clog air passage.

Between the two coils is the "Oilout"*, which purges the system of crankcase oil and dirt, keeps it always at full capacity.

The "Balanced Wet Bulb"* control holds head pressure low, automatically giving the full benefits of power saving in cool weather and providing always full capacity for peak loads.

Niagara Aeropass design results from over fifteen years' experience condensing by air. It is completely trustworthy for year' round operation. Users say, "It saves half the difficulties and labor of running a refrigeration plant."

Units range from 10 to 100 tons capacity.
For full information ask for Bulletin 103.

NIAGARA BLOWER COMPANY
Over 35 Years of Service in Industrial Air Engineering
Dept. IR, 405 Lexington Ave., New York 17, N.Y.
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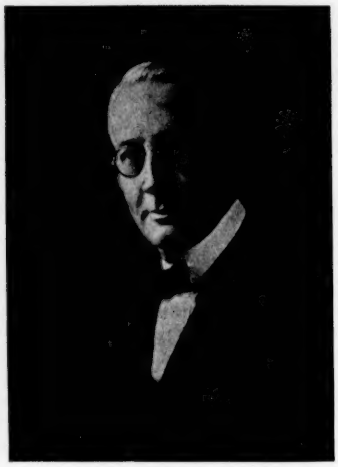
INDUSTRIAL COOLING HEATING • DRYING
NIAGARA
HUMIDIFYING • AIR ENGINEERING EQUIPMENT

OBITUARY

J. L. Rowland

THE death of J. L. Rowland, owner and manager of the Fayette Ice & Coal Co., Fayette, Mo. occurred March 19 at Lee Hospital, where he had been a patient since April, 1947. Mr. Rowland was well known throughout the ice industry of his state. He served as president of the Missouri Ice Manufacturers Association for nine years, until he asked to be relieved of that office in 1943. At that time the association presented him with a watch and luggage and appointed him life-time honorary president.



J. L. Rowland, Fayette, Mo.

In October 1927 after having managed coal mines for the Corrigan Coal Co. near Novinger, Mo., and serving as field manager for the Midland Coal Co., with home office in Kansas City, he and his brother, C. K. Rowland, attorney, of St. Louis, purchased the Fayette Ice & Coal Co. from the late John Bell. A frozen food locker plant, one of the first such plants in Missouri, was added. For about two years he and his brother owned the Higginsville, Mo., ice and locker plant but it was sold when his health began to fail.

Mr. Rowland was civic minded, always energetic in community affairs. He was a member of the Kiwanis Club and was a charter member of the Fayette Rotary Club. During Warld War I he was among the dollar a year men serving as Solid Fuel Administrator for the State of Arkansas, Oklahoma and Missouri and was on a national board of similar nature. Besides his activities in connection with the Missouri Ice Manufacturers Association, he was an active member of the National Association of Ice Industries and appeared on programs of other state association conventions. He was a member of the Methodist Church, the Masonic lodge, the Shrine, American Saddle Horse Association.

He leaves a son, J. L. Rowland, Jr., of Jefferson City, and a daughter, Mrs. Harry A. Hansen of St. Louis.

WILLIAM CLEVELAND GRAVES who had been connected with the Beare Ice & Coal Co., Jackson, Tenn., for forty years died February 22. He was 65 years old. Surviving are his widow and one daughter.

Frank A. McIntosh

THE death of Frank A. McIntosh, owner of the Needham Ice Co., Needham, Mass., a life-long resident of that city, occurred March 19. Mr. McIntosh was well known throughout New England and had been an active member of the New England Ice Association for many years. He leaves a daughter, Mrs. P. Bond of Pepperell and three sons, George C., Frank R., and Russell Q. of Needham.

Carl R. Parks

FOLLOWING a stroke while driving his automobile, Carl R. Parks, treasurer and manager of the Peoples Ice Co., Warren, Ohio, died in Trumbull Memorial Hospital April 11. He was 63 years old. While driving his car Mr. Parks became ill and the car continued and crashed into a stop sign. He had lived in Warren 15 years. He was a member of the Elks Lodge. He is survived by his widow, Mrs. Fannie Parks, and a daughter, Mrs. Virginia Reinholm.

PAUL SMITH, assistant to the president of the Manhattan Refrigerating Company, New York City, died March 24 at his home, 55 Grand Avenue. He was 60 years old. Mr. Smith, in addition to his connection with the Manhattan Refrigerating Company, was associate director of the Alien Property Bureau of the Department of Justice. He is survived by his widow, Mrs. Barbara F. Smith, a daughter, Barbara N. Smith and a son, Paul Smith, Jr.

MARK R. MAIRS, Potacaligo, W. Va., storage manager for the Diamond Ice & Coal Co., Charleston, W. Va., died February 25 of a heart attack. Mr. Mairs had been employed by the company for forty years. He was a member of Elmore Memorial Adventist Church and was a former school teacher. Surviving are his widow, Mrs. Emma Mairs, one son, Marcus R., and two daughters, Edith and Jean.

ROBERT MCINTYRE, chief engineer at the City Ice & Fuel Company plant, Kansas City, Mo. from 1930 until last November, died March 28 at the Trinity Lutheran Hospital. He was 78 years old. He leaves two daughters, Mrs. Catherine Kessinger and Mrs. Roberta Withers, both of Kansas City.

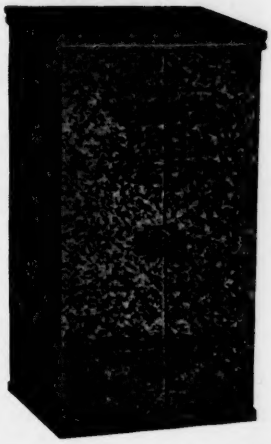
JOHN RICHARD, 29, owner of Richard's Ice Company, Niagara Falls, Ont., died April 2 following a short illness. He was active in sports in the area, having organized many athletic teams. His wife, mother and two brothers survive.

PATRICK EARL MCMANUS, 47, route supervisor for the Mona Lake Ice company, Muskegon, Mich., where he was employed 25 years, died March 5 after a three-month illness. Survivors include the widow, Lena, three daughters, two sons, a sister, two brothers and three grandchildren.

GEORGE A. DUNNING, chairman of the board of the Standard Ice Co., Philadelphia, Pa., died at his Chestnut Hill home, March 22, after an illness of several months at the age of 91. Mr. Dunning was the oldest surviving graduate of Princeton University. His widow, two sons and three daughters survive.

EDWARD ANTHONY SCHNEIDER, 77, retired ice merchant, died February 18. For more than 20 years he managed the Citizens Ice Company in Lockport, N. Y., retiring several years ago. His wife and a daughter survive.

OHIO SPECIAL ICE CANS



Double Riveted Welded
Integral Tube Cans
Arctic Pownall Cans
Can Baskets
Condenser Trough

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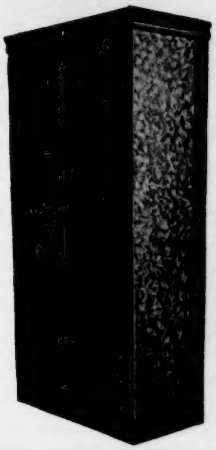
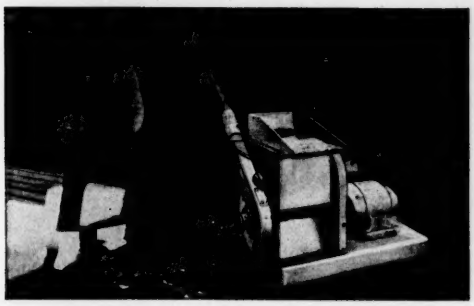
Industrial Trucks and Trailers



THE OHIO GALVANIZING & MFG. CO.

NILES — Established 1902 — OHIO



An ice business builder that benefits everybody

Top-icing produce shipments in transit with snow-ice benefits everybody. It builds new, year-round markets for ice manufacturers and dealers . . . it makes shippers happy because it keeps produce in better condition for higher prices . . . it cuts down labor costs and saves shipping space.

Snow-ice is produced by the Link-Belt Ice Crusher-Slinger, available in a number of sizes and styles. For details ask for Book No. 2261.

LINK-BELT COMPANY
2410 W. 18th St., Chicago 8, Ill.

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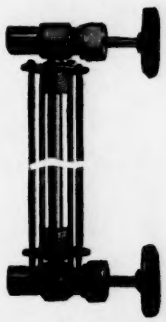
LINK-BELT ICE CRUSHER-SLINGER

SHANK
REFRIGERATION PRODUCTS

Provide maximum service under toughest operating conditions.



ALL-STEEL GAUGE SETS
All-Steel Construction. Automatic shut-off of liquid in case of glass breakage. Composition packing rings give long life, no-leak seal.

PURGE VALVE
Compact—Machined from bar stock steel—Full size ports — Completely rust-proofed — Highest grade graphited composition packing. All popular sizes.

See your jobber—or write us for prices.

CYRUS SHANK CO.

629 W. Jackson Blvd. — Chicago 6, Ill.

NEW AND IMPROVED EQUIPMENT

MACHINERY-APPLIANCES-PROCESSES

Information contained in this department is furnished by the manufacturer of the article described and is not to be construed as the opinion of the Editor.

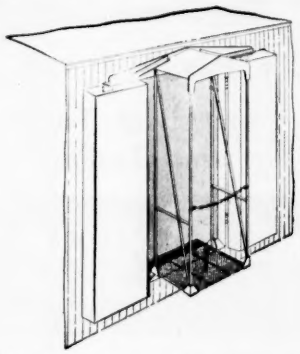
Top Icer Equipment

EQUIPMENT which speeds the job of top icing rail cars of produce has been announced by Link-Belt Co. Developed by their engineers in cooperation with the Railways Ice Co., the new machinery also adds safety to the work of placing ice on the commodities in the cars.

The new rail type top icer is a high capacity conventional type crusher-slinger mounted on a self-propelled car traveling at 300 ft. per minute on rails which are approximately on the same elevation as rails of adjacent tracks. A deflector on the machine removes ice cakes from the delivery conveyor, from where they are transferred to crusher-slinger by a feeder conveyor.

The machine will crush block ice at the rate of nine 300-lb. cakes per minute (80 tons per hour) and deliver the finely crushed ice to the produce in car through a pipe and flexible hose arranged to permit icing of cars on either side of the machine. A canopy protects the operator, who controls all operations from his station on the machine. Space is provided for transporting an operator's portable safety car door platform from door to door.

Control equipment can be arranged so that the operator on the machine can stop and start all conveyors bringing ice blocks from storage to the machine. Voice communications can be provided between the operator, the storage house and other stations.

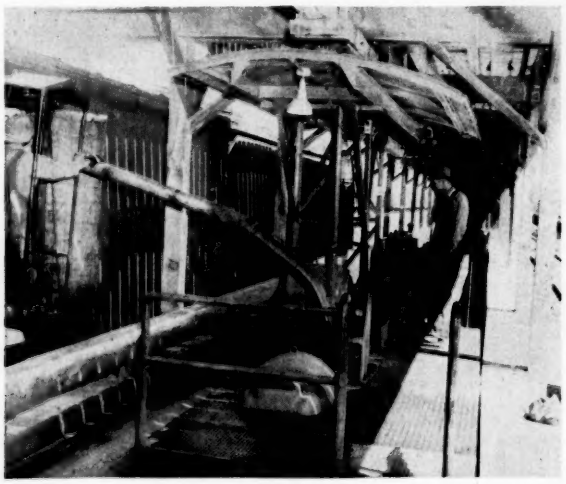


Link-Belt Rico portable safety car door platform for top-icing installations.

The portable safety car door platform is a sturdy lightweight portable metal platform which is suspended from the tops of open doors of refrigerator cars to provide a convenient working location for the operator who directs the discharge of ice from the hose of top icing equipment.

It holds car doors open; moves with the car, thereby preventing accidents from unexpected train movement; allows full vision of entire operation; protects operator from falling ice; supports discharge hose; reduces operator fatigue; and eliminates the need for ladders or other precarious forms of support.

Link Belt Co., 307 N. Michigan, Chicago 1, has published an 8-page illustrated Book No. 2089 containing arrangement drawings and installation views of their new line of car icing equipment. Copies will be forwarded to any interested reader upon request.



Link-Belt Rico self-propelled rail type top icer.

Frost Control Cream

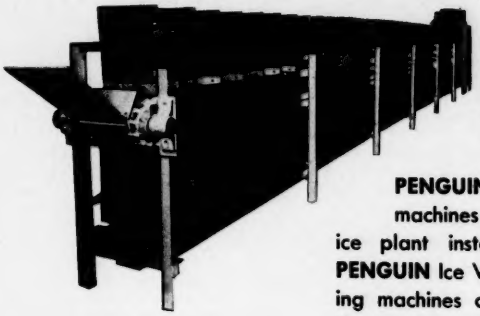
A NEW product which is a bland odorless cream called O.F.C. (Ozo Frost Control) has been sold nationally for about six months, and is of considerable interest to operators of refrigeration equipment. O. F.C. increases efficiency by reducing defrosting time as much as 60 percent. It controls frost formation on coils and plates, thus saving on compressor operation, and retards corrosion of metal coils and fittings by drawing moisture away from the coil. Heavy ice formations are eliminated or reduced.

The manufacturer claims that less than two pounds is needed for 100 linear feet of 2 in. pipe and one application lasts through several defrostings. The frost that forms when O.F.C. is used is easily brushed off with a stick or brush and is loosened by gentle tapping. This is very important where valves or flanges must be operated quickly and without O.F.C. might be rendered inoperative by solid ice.

Another important use is the prevention of sticking freezer doors caused by accumulation of ice and frost. This product is said to seal the contact surfaces of jambs and frames, thus preventing loss of refrigeration and the annoyance of frozen-up doors, damaged gaskets, and loss of time. B. Heller & Company, 40th St. & Calumet Avenue, Chicago 15, Ill., will send a descriptive folder and directions for use on request.

Penguin ICE SERVICE

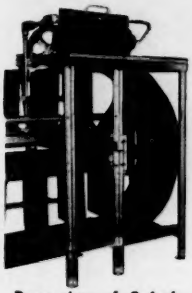
Positive 24-hour service with... PENGUIN PADDLES



POSITIVE DELIVERY of ice identifies the PENGUIN vending machine with the PADDLES

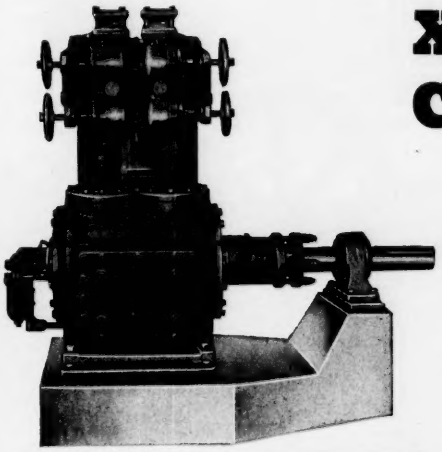
PENGUIN PADDLES PAY MORE PROFIT

PENGUIN aluminum ice vending machines are sold separately for ice plant installation or installed in **PENGUIN** Ice Vending Stations. Vending machines are constructed to vend the ice your customer wants . . . when he wants it . . . NOW!



Rear view of 2-deck machine showing motor controls, etc.

TOWAL MANUFACTURING CO.
MARION ILLINOIS, U. S. A.



Also manufacturers of Ammonia Valves in all sizes up to 8 inches.

XL AMMONIA COMPRESSORS

HAVE LONG LIFE and DEPENDABILITY

XL Ammonia compressors are equipped with roller bearings—ring plate valves —force feed lubrication for slow or high speed operation.

HILGER CHIP ICE MANUFACTURING UNITS

Now available in capacities to make 100 to 3000 pounds of ice per HOUR. For FISH—POULTRY—SAUSAGE and VEGETABLE PROCESSING PLANTS.

For full information and details, write or wire—

AIRCRAFT PRODUCTION ENGINEERS

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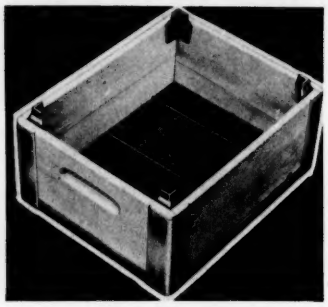
1834-54 W. 59th Street
Cable Address: "AIRPROENG"

CHICAGO 36, ILLINOIS
Phones: PROSPECT 6-7000

New Baker "Icertray"

ICERTRAY the wire screen bottomed wooden milk crate icer which L. S. Byrum of Southern New England Ice Co. displayed at the Merchandising session at the NAII convention in New York last November is now in production, according to the Baker Box Co., Worcester, Mass., builders of milk crates.



The New Baker Ice Icertray

The Icertray, when filled with 20 lbs. of crushed ice, stacks with standard milk crates just as would another section in a sectional bookcase. Mr. Byrum pointed out that no matter how high milk crates are stacked, it can be spaced to fit the cooling job required for any predictable length of time, and additional milk trays stacked on top as high as storage space or truck top permits. He said that while initial cost is higher than bags, cost of depreciation and maintenance and over-all cost is less per trip or per year.

Conforming to standard milk crate size, except for depth, it can be handled on standard milk crate conveyors, plants or distribution points and easily handled on hand or power trucks between the crusher, fillers and point of use or transport. The method of icing crates on top, it is pointed out, is effective for keeping fresh milk under proper refrigeration between bottling plant and consumer or dealer and use of the Icertray eliminates much of the slop and waste of ice that accompanies the usual shovelful of ice on top of each crate and prevents bottle scratching or breakage.

It uses run-of-crusher ice which often can be produced from truck "returns", cracked or broken blocks. Proposed method of use is for the ice company to furnish filled Intertrays at a price to cover ice and service plus amortization of the trays, or for the dairy company to provide the crates and the ice company charge only for ice and the service involved.

Further information may be had from The Baker Co., 161 Union St., Worcester, Mass., or their representatives.

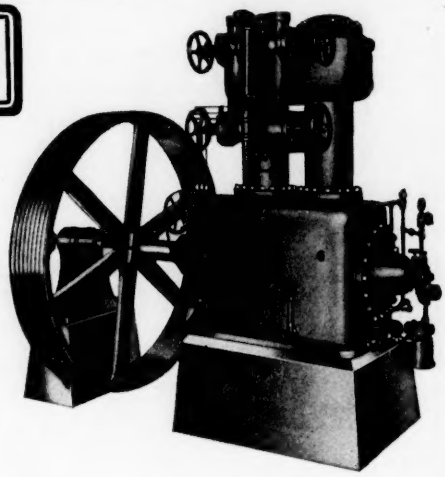
New Plastic Packing

A NEW, non-jacketed plastic packing called "versi-pak" has been announced by the Packing Division of Raybestos-Manhattan, Inc., Manheim, Pa. The manufacturer claims that it can be used in an exceptionally large variety of applications, and will give long service, increase operating efficiency and maintain an effective seal. It is available in two formulas—black, graphited for general service, and white, non-graphited for food handling and other services.

Versi-pak has greater density than woven or braided packings, and is more resilient than die-formed packings. As a result it conforms more readily to the shape of the stuffing box, and as it wears the gland can be drawn up, condensing the material and keeping it in service longer than would otherwise be possible. It is recommended for use in many plants, including refrigeration where temperatures do not exceed 350 F and for pressures up to 600 p.s.i. where "bull" rings or close-clearance glands are provided. It may be used against higher temperatures when provision has been made for cooling the stuffing box, rod and gland.

Versi-pak is available in sizes from 1/8 to 1 in. in increments of 1/16 in. in spirals and butt-cut rings. For complete information write for bulletin A-941.

Sterling DEPENDABLE REFRIGERATION



The phrase "STERLING DEPENDABLE REFRIGERATION" is more than a slogan—it's a fact.

Built with rugged strength for endurance, with advanced design for efficiency and economy of operation, STERLING Ammonia Compressors are the product of more than fifty years of "know how" in the manufacturing of refrigeration machinery and equipment.

A complete range of sizes insures the correct compressor for each application.

Deliveries are, at present, current—most models of compressors are available from stock.

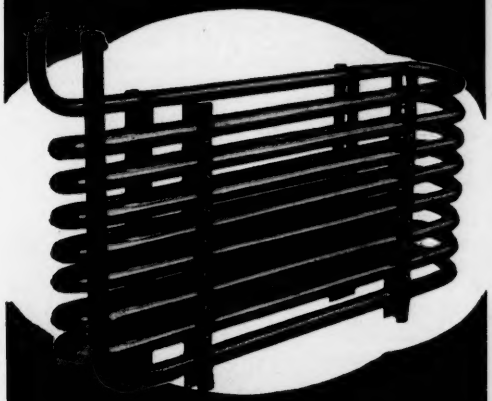
For complete information, see your nearest STERLING distributor, or write the factory.

REYNOLDS MANUFACTURING CO.

SPRINGFIELD *"Builders of Fine Refrigeration Equipment"* **MISSOURI**

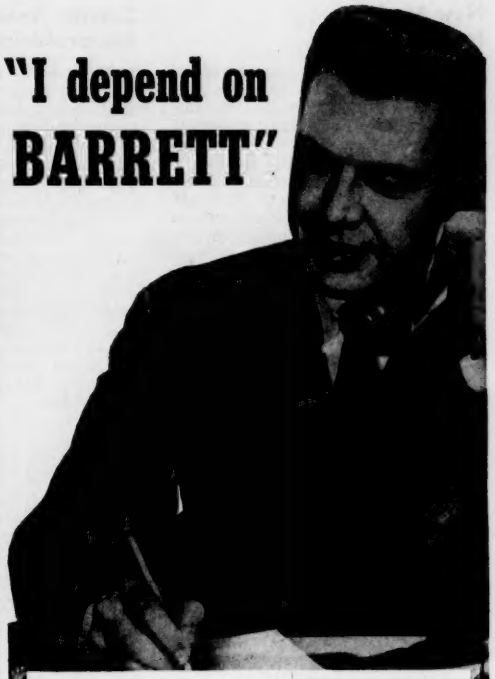
Coils

Smooth Bends
Perfect Welds
Exact Measurements



For over sixty years, the National Pipe Bending Coils have proved their quality in Ice and Refrigeration plants

"I depend on BARRETT"



"Yes, I always buy Barrett Standard Anhydrous Ammonia. I know from long experience that the name Barrett means unexcelled purity, consistent high quality and dependable service.

"I never worry or fret after I place my order. My shipments arrive on time... the cylinder valves are in good working condition... and Barrett picks up empties promptly.

"When I need help on a technical problem, I get the expert advice of Barrett's trained technicians, without charge or obligation. Barrett is the name to remember when you need ammonia!"

Barrett STANDARD ANHYDROUS AMMONIA

Available in 150, 100 and 50-pound cylinders for speedy delivery from stock points conveniently located from coast to coast.

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
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Barrett

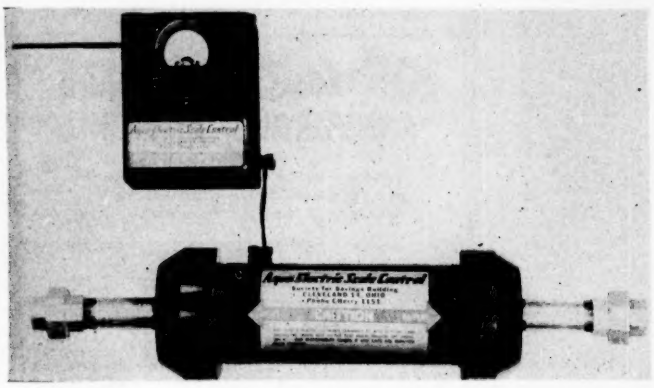
New Model Ice Pick Vendor

IN RESPONSE to many inquiries and the interest shown in the Pickwell Ice Pick Vendor, (March 1950, page 83) the United Ice Supply Company of Boston has developed an additional vendor, which will vend ice picks at 15 cents each. Both the 15 cent and the 10 cent Pickwell Vendors are of the same specifications and quality and both machines are guaranteed. The price of the 15 cent Pickwell Ice Pick Vendor is only slightly higher than the one vending for 10 cents. Full information regarding the operation will be given upon request. Write to 55 Beverly St., Boston 14, Mass.

Electric Water Conditioner

THE Aqua electric scale control is designed to effect reduction and prevention of hard scale formation in boilers, heat exchangers, bottle washers, air conditioning systems, and other equipment using or cooled with water. By passing water through an electric field of the proper intensity, the colloidal particles and dissolved salts act as a conducting medium, picking up an electrical charge adjusted in proportion to the electrical conductivity of the water itself.

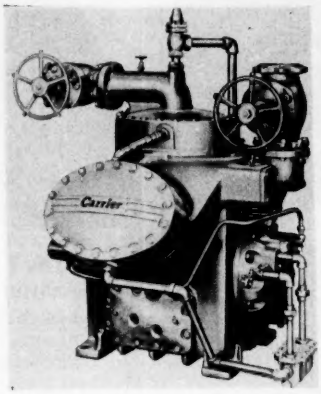
Through this purely physical action, the particles in the water are no longer attracted to, and do not build up on, the tubes, castings, and other metal surfaces with which they come in contact. The unit is inexpensive, compact, light in weight, and easy to install. The Aqua cylinder is made of a plastic material which is a non-conductor and non-corrosive. The Aqua control box contains the electric equipment which is set to treat the characteristic properties of each particular water. It is used with any 110 Volt, AC, 60 cycle outlet and the operating cost is less than that of the average electric clock.



Aqua electric scale control.

Carrier Announces Large Reciprocating Compressors

TWO new models of large reciprocating compressors, developed to meet commercial air conditioning and refrigeration application needs from 100 to 150 hp in single units and designed to operate with a variety of refrigerants, are announced by Carrier Corporation, Syracuse, N. Y. They can be used either direct or belt driven, powered by motor, gas or Diesel engine, or steam turbine with gear and can be adapted for operation as dual units from a single motor with a double shaft. The high partial load factor of these new machines is due to the design in cylinder unloading which also provides unloaded starting so that normal torque motors may be used.



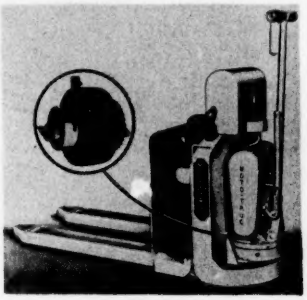
New Large Carrier Reciprocating Compressor

They can be operated on Freon 12, Freon 22 and ammonia. Model 5J40, a four-cylinder machine, using Freon 12, has a nominal cooling capacity of 100 tons for air conditioning and 65 tons for refrigeration, or using ammonia, for refrigeration duty, 60 tons. Model 5J60, a six-cylinder compressor, using Freon 12, has a capacity of 150 tons for air conditioning and 100 tons for refrigeration, or, using ammonia for refrigeration duty, 90 tons.

Designed for compactness, the compressors may be mounted on upper floors as weight and vibration are greatly minimized. Speeds of 900 maximum for Freon 12, and 720 for ammonia, are based on conservative coefficients of bearing pressure and friction. The two machines have identical bores and strokes, and the cylinder sleeves, valves, and other operating parts are interchangeable, so that service is greatly simplified and reduced in cost.

New Light Pallet Truck and Brake

A NEW, shorter, lighter 12- or 18-volt pallet truck, and an automotive-type, internal expanding brake has been announced by The Moto-Truc Co., Cleveland, Ohio. The brake is mounted on the side of the drive wheel as an integral part. Two internal expanding, self-synchronizing, vulcanize-lined brake shoes inside a cast Meehanite drum provide smooth, positive brake action under all load and floor conditions. Simplicity of design lowers manufacturing and maintenance costs. Operating safety is increased by eliminating excessive strain and wear on chains, shafts, etc., ordinarily caused by a brake mounted elsewhere on the truck.

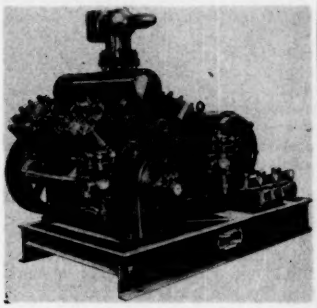


New Pallet truck with enlarged inset of internal brake.

Another advantage claimed for the new Moto-Truc pallet truck is its shorter over-all length, only 23¾ inches longer than the load, for operating in smaller spaces. The roller-type handle controls two speeds forward and two speeds reverse. Electric pump is located on top of truck for accessibility. Safety is accented by exclusive all-welded frame, motor guard for protection from operator's feet, and "dead man controls." Lower battery mounting is pointed out as improving stability.

Brunner Announces New Compressor Model

THE Brunner Manufacturing Co., Utica, N. Y., has expanded its refrigeration condensing unit line to include the new R-75 compressors, available in six models. Compressor, motor and bed plate combinations, for use with evaporative condensers in 50, 60 and 75 hp. sizes, will be known as models E-50000, E-60000 and E-75000. For use with water cooled condensers the same sizes are identified as W-50000, W60000 and W-75000.



The new Brunner R-75 compressor

In design the R-75000 is a fully pressure lubricated 8 cylinder, 90 degree Vee type compressor with 2 cylinders to a block. Blocks and crank case are of close-grained, non-porous, special analysis cast iron. Pearlitic cast iron crankshaft with induction hardened journals and pins are used. Throws are arranged so that a discharge stroke occurs every 45 degrees, thus aiding easy starting and smoothing out of power impulses. Cast iron piston, malleable connecting rods, diamond bored bronze bushings, all machined and assembled under high precision methods, contribute to the efficiency and relatively quiet running of these units.

A feature is the Brunner design valve assembly noted for its ruggedness and excellent performance. Both suction and discharge valves are of the reed type. On the suction side is a 4 in. service valve with two 2½ in. service valves on the discharge side.

Unloaded starting and capacity control equipment is optional. The four step capacity control can be made responsive to suction pressure, space temperature, damper position, etc. Openings in two of the four cylinder heads are provided for installation of relief valves if required. Oil pressure failure protection is provided by an automatic device. All units are bolted to a mounting base constructed of structural steel.

The manufacturer advises that current deliveries are on a three week schedule and it is expected to reduce this to practically a "from stock" basis as demands for all sizes can be more uniformly charted.

Palletize and Stack Materials with the MOTO-TRUC!

REFRIGERATED WAREHOUSES HAVE REDUCED AISLES AND INCREASED STORAGE SPACE

MOTO-TELESCOPIC HI-LIFT TRUCK

Capacity: 4,000 lbs., 80" lift; 2,000 lbs. up to 144" lift. Patented articulating hinged spring unit holds drive wheel down on floor for better traction.

33"

MOTO-TRUC MOTORIZED, BATTERY OPERATED WALKIE TRUCKS ARE UP TO 15" SHORTER IN OVERALL LENGTH. THEY TURN IN SMALLER SPACES, AND UNUSUALLY EASY CONTROL REDUCES OPERATOR FATIGUE.

Moto-Trucs are definitely the outstanding trucks of their type. They are backed by the longest experience and their all around leadership proves unusual creative ability.

THEY GO MORE PLACES because of their shorter length due to more compact power unit.

ALL CONTROLS are in easy grip roller type handle.

THEY ARE SAFE. Dead man controls and other safety features are a dependable protection for both operator and loads.

MOTO-PALLET TRUCK. Capacity 4,000 pounds. Patented Nydegger shackles on load wheels insure smooth travel over uneven floors, elevator entrances, etc.

Write for Literature

PALLET TRUCKS • HI-LIFT TRUCKS • PLATFORM TRUCKS

The MOTO-TRUC Co.
1953 E. 59th Street
CLEVELAND 3, OHIO.
ORIGINATORS OF MOTORIZED HAND TRUCKS

Serdex Provides Humidity Readings

ADVANCES in industry during the past several years have demonstrated a need for increased accuracy and sensitivity in the measurement of humidity. This is especially true in refrigerated warehouses where the percentage of humidity in the air is very important and where it is necessary to obtain accurate readings.

The activities of Serdex, Inc., in this field is centered entirely upon the use of animal membrane as the sensitive element, which material has been used for that purpose for the last 200 years. This material has always been recognized as basically positive in its reaction to moisture and reacts more quickly than any other hygroscopic material, but to provide for its reaction in more consistent manner a diaphragm was developed by Serdex. With this as a basis or actuating element, hygrometers and recorders have been produced which, it is claimed, are accurate within limits not heretofore approached and sensitive to the extent of establishing lag not heretofore obtainable. These hygrometric instruments are available in relatively low price ranges with proven accuracies and sensitivity for usage in critical controlled industrial uses as well as research laboratories. The limit of their usefulness covers the low temperature range present in refrigerated warehouses.

The Serdex laboratory standard hygrometer Type HGS-HY-1 is recommended for practical uses in refrigerated warehouses. The lag constant of this model is said to be the lowest on record and an accuracy of 1½ percent relative humidity is warranted. In the matter of lag, however, the manufacturer states that it must always be kept in mind that when an instrument is taken from one environment abruptly into another, there being a wide spread in the temperatures of the two locations, the instrument must be allowed sufficient time to come into equilibrium with the new environment, otherwise the sensitive element will be measuring the condition of its housing instead of the general condition of the room. It is for this reason that refrigerated warehouses generally procure a sufficient number of instruments to enable usage under specific conditions without the need of the time allowance that wide spread temperatures make necessary.

Serdex Laboratory Standard Hygrometer

Aids in Applying Insulation

"STIC-KLIPS" a product of the Stick-Klip Manufacturing Co. provide a mechanical method of applying all types of low temperature insulation which, according to the manufacturer, assures a positive and strong bond which can be tested and proved before the application of the insulating material.

Additional advantages with this type of construction, says the manufacturer, is that the quality of vapor barriers can be predetermined. Also hot emulsions as a bonding agent are eliminated and the insulation is handled dry and instantly secured.

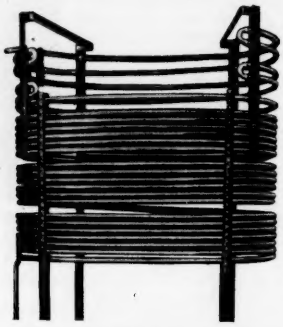
The method of "Stic-Klip" cold storage insulation construction is clearly described and illustrated in Application Bulletin 3 prepared by the Stic-Klip Manufacturing Co.

PITTSBURGH
Air Pressure Tested COILS

Electrically welded, continuous; Air-Pressure-Tested while submerged in water. Built to your specifications. Send for new Coil Data Book and let us quote.

Welded Headers—Welded Ammonia Receivers
Accumulators—Pipe Coils—Bends—Boilers Tubes

Pittsburgh Pipe Coil & Bending Company
61 BRIDGE STREET, ETNA, PITTSBURGH 23, PA.



Approved by Underwriters' Laboratories, Inc.

CONTROL ODORS AND MOLD
GENERAL OZONE *Air Clear* EQUIPMENT OFFERS ADEQUATE PROTECTION FROM MOLD AND ODORS

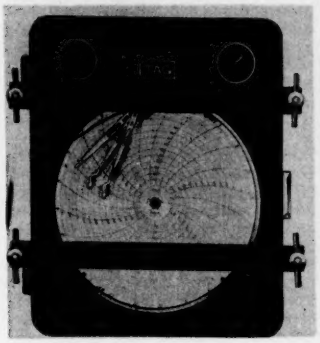
Use *Air Clear* wherever food commodities are stored to reduce spoilage. General Ozone has a complete line of modern ozonizing equipment plus full service facilities for both old and new types. Write us today for further information.

GENERAL OZONE CORPORATION
17 West Sixtieth St., New York 23, N. Y. 1455 West Congress St., Chicago 7, Ill.

Manufacturers of ozone generating equipment for cold storage ● warehouses refrigerated cars ● walk-in coolers ● air recirculating systems.

New Tag Instrument Controls Humidity

AN instrument which records and automatically controls humidity has been announced by the Weston



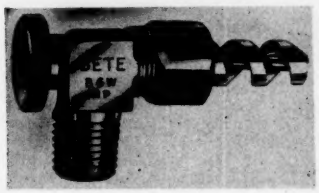
New Tagliabue instrument to control humidity.

Electrical Instrument Corporation, 614 Frelinghuysen Avenue, Newark 5, N. J., manufacturer of Tagliabue and Weston instruments. Utilizing the psychrometric wet and dry bulb principle, the controller automatically regulates the wet-bulb (relative- humidity) depression for which it is set, regardless of any fluctuations in the dry-bulb temperature.

Two pens operate on a circular 10-inch chart, simultaneously recording the dry-bulb temperature and the wet-bulb depression. The flow of the humidifying agent, moisture, steam or oil fog, is regulated by a valve which is operated by the control instrument. Tagliabue developed this control system for all process industries.

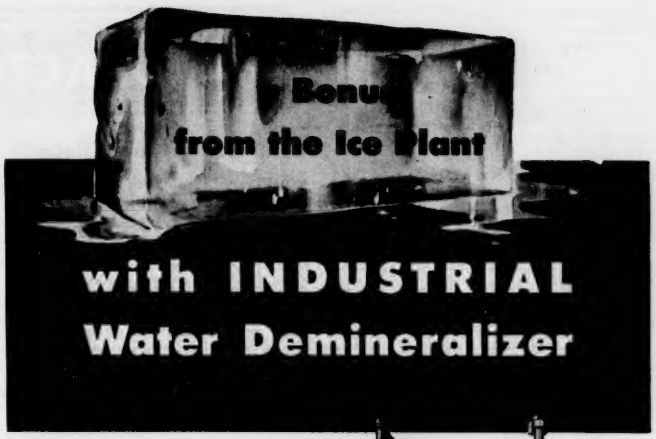
Spiral Nozzle for Wide Angle Spray

UNUSUALLY wide angle sprays can now be obtained by means of a newly designed spiral nozzle, according to an announcement by the

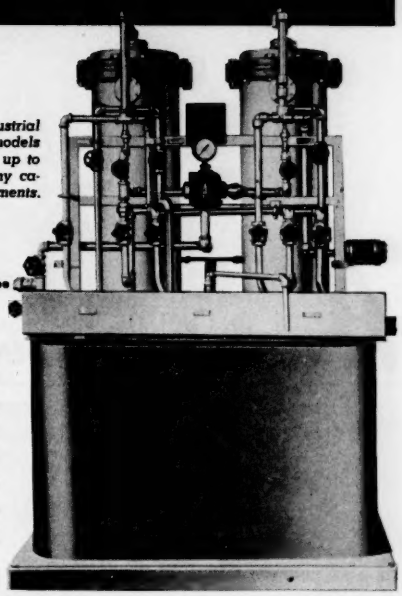


New Bete Fog Nozzle for wide angle spray patterns and low flow rates and pressures.

Bete Fog Nozzle Co. of Greenfield, Mass. The new nozzle is the latest addition to a line of nozzles using a patented spiral principle, first put on



A typical two-bed Industrial Water Demineralizer. Standard models available with capacities up to 1000 gph. Special units of any capacity engineered to requirements.



Here's how it works...

Instead of running ordinary city water into the freezing tanks, it is passed through the Industrial demineralizer where beds of ion-exchange resins remove the dissolved mineral salts—delivering the chemical equivalent of pure water.

With this pure water there are no minerals to deposit in the core—so the whole core-pulling operation is eliminated. Furthermore, the amount of ice which cracks in the cans is appreciably reduced. And the transparency of the whole cake is improved—your customers will notice the difference and like it.

It's easy to find out how to get this big bonus from your ice plant. Send us an analysis of the water you are using, the quantity you need, and at what rate (gallons per hour). We will send you complete information on demineralized water, estimate of costs, performance data, etc. Better look into it right away.

FILTERS Pressure Type · PUMPS Centrifugal · CORROSION TESTING APPARATUS Salt Fog • Humidity

INDUSTRIAL FILTER & PUMP MFG. CO.

1635 West Carroll Avenue
Chicago 12, Illinois

RUBBER DIVISION Vulcanized Linings • Molded Products · WATER DEMINERALIZERS

the market last year by the Bete Company.

In addition to the wide angle of spray, the new nozzle was designed for low flow rates and requires extremely low pressures, according to the manufacturer. It will produce fine and uniform drop sizes with a 180 degree umbrella spray pattern of wide coverage. The nozzle, due to its spiral design, is relatively non-clogging and can be easily cleaned on the job by means of removable pin. The pin itself is interchangeable to provide for different flow rates. It is now available in two sizes, for ½ to 2 g.p.m. and for 1½ to 4 g.p.m. capacities.

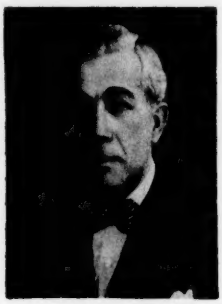
MANUFACTURERS' NEWS

Emil Skarda Joins Reco

THE appointment of Emil F. Skarda as manager of the RECO International Division has been announced by Refrigeration Engineering Corp., Philadelphia, Pa. Mr. Skarda comes to RECO with a background in international trade. He has been, until recently, export manager of Wilson Refrigeration, Inc., and has had world-wide experience establishing a network of distributors. He has traveled abroad as a special export consultant of the War Assets Administration, as export manager of Wilson Refrigeration, Inc., and as an officer of the armed forces assigned to military government duties. He is a member of the Air Conditioning and Refrigeration Advisory Board of the Office of International Trade, and Committee Chairman of the Refrigeration Equipment Manufacturers Association, as well as a member of the Export Managers Club of New York City. His duties at RECO concern themselves with organizing distribution channels for RECO ice makers, commercial block ice plants, prefabricated sectional, walk-in freeze coolers, cold storage equipment, marine cargo reefers, and other RECO products.

Herbert Smith Joins Alco

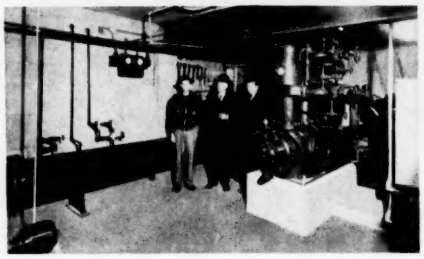
THE Alco Valve Co., St. Louis, Mo., has announced an addition to its staff of Herbert A. C. Smith as field engineer. His territory, with headquarters in Philadelphia, will include Eastern Pennsylvania and Southern New Jersey, the States of Delaware, Maryland, and Virginia, and the District of Columbia.



Herbert A. C. Smith

Mr. Smith comes to Alco from Baker Ice Machine Co. where, since 1947, he held the position of district manager in the St. Louis area. Previously he was associated with the York Corporation of York, Pa., from 1933 until 1947, and Copeland Products Inc. from 1928 until 1933. His extensive business experience in refrigeration equipment is supplemented by a thorough engineering education. He studied engineering at the Royal Naval College, Dartmouth, England, supplemented by training at the Georgia School of Technology.

Another CP Engineered Rink-



DIXIE ARENA
Dixie, Ontario

Pictured by the CP Ammonia Compressor from left to right are: Earl Howard, Manager, and L. Pallette, President of Dixie Arena Co., and H.W. Nellist, in charge of Creamery Package Canadian operations.

CREAMERY PACKAGE is proud to have helped engineer in complete detail the recently opened modern DIXIE ARENA at Dixie, Ontario, operated by the Dixie Arena Co.

Ice area is 185′ by 85′ and required 43,000 ft. of piping for the brine. The CP refrigeration system installed includes a 9 x 9 CP Ammonia Compressor with automatic controls, a Shell and Tube Brine Cooler, an Evaporative Condenser, and one 900 gal. per minute brine pump.

Whether you are planning a rink for public skating, hockey or curling, CP Refrigeration Engineers will be glad to work with you.

THE Creamery Package MFG. COMPANY

General and Export Offices: 1243 W. Washington Blvd., Chicago 7, Illinois

Atlanta • Boston • Buffalo • Chicago • Dallas • Denver • Houston • Kansas City, Mo. • Los Angeles • Minneapolis • Nashville • New York • Omaha • Philadelphia • Portland, Ore. • St. Louis • Salt Lake City • San Francisco • Seattle • Toledo, Ohio • Waterloo, Ia.

CREAMERY PACKAGE MFG. CO. OF CANADA, LTD.
267 King St., West, Toronto 2, Ontario

THE CREAMERY PACKAGE MFG. COMPANY, LTD.
Avery House, Clerkenwell Green, London, England

REPAIR CEMENT

YOU CAN PERMANENTLY REPAIR AND WATERPROOF BREAKS, CRACKS AND HOLES IN STONE, CONCRETE, BRICK AND TILE.

COMCO READY-MIXED REPAIR CEMENT WILL DO THE JOB

Simply add water only and this cement becomes as hard as iron and sticks permanently to all concrete surfaces. It will not shrink. Comco Cement is waterproof, wearproof, dustproof and oilproof, and will withstand acid and alkali, producing an indestructible floor.

Comco Cement will withstand foot traffic after it has set 25 minutes. After 8 hours it will stand up under heavy-duty trucking. Comco Ready-Mixed Cement is chemically perfect, not just another flooring compound. It is guaranteed to stand up under all conditions, no matter how severe. Comco Cement will permanently line and waterproof hot and cold water tanks.

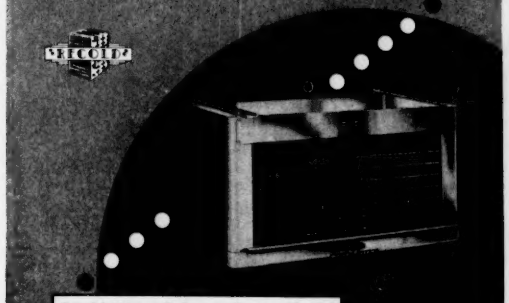
When ordering, specify Comco Resurfacing Cement for large areas, and state whether it is to be used in a refrigerated or hot room.

1 bag (100 lbs.) covers approximately 44 sq. ft. ¼-in. thick, the required thickness for heavy-duty trucking. 100-lb. bag.....$11.00

All prices F.O.B. Factory, Chicago

CONCRETE MATERIALS CORPORATION
318-320 W. HUBBARD ST., CHICAGO 10, ILLINOIS

RECOLD
WATER DEFROST COILS



Recold Water Defrost coils provide the most positive, simple, and by far the most economical method of defrosting that has ever been introduced. Defrosting can be done in five minutes with absolutely no product warm-up.

The Recold line includes equipment for every commercial refrigeration and air conditioning application.

FOR EVERY LOW TEMPERATURE APPLICATION

Refrigeration ENGINEERING, INC.
Los Angeles 22 Calif

the low-cost low-temperature BRINE MEDIUM

SOLVAY Calcium Chloride

Available for Immediate Shipment from more than 200 local stock points.

Free Literature on Brine Maintenance . . . available on request.

SOLVAY SALES DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

Recold Appoints Quinn Director of Sales

HARRY L. QUINN has been appointed director of sales for all Recold products excepting those in the oil and gas Division. This announcement was made early last month by Hy Jarvis, vice-president and general manager of Refrigeration Engineering, Inc.

H. L. Quinn

The appointment of Mr. Quinn as director of sales follows his brief association with the company as sales manager of the Air Conditioning Division. His experience in the field of commercial refrigeration which dates back to 1925, began with the Frigidaire Sales Corporation with whom he spent more than fifteen years. In 1941 he joined the Pacific Lumber Co., in the Insulation Division. During 1947 and 1948 he held the position of sales manager of the Eastern Division, Drayer-Hanson, Inc., with offices in New York City. He also made a number of air conditioning installations for Warner Brothers Motion Picture Studios.

Brunner President Resigns

GEORGE L. BRUNNER JR. has resigned as president and a director of the Brunner Manufacturing Company, Utica, N. Y., effective April 1. Both resignations were accepted by the company's board of directors. A. G. Zumbrun, who has been chairman of the board and executive vice president since April, 1947, will become president.

MR. Brunner announced that since the death of his father, Oct. 28, 1949, he now controls the Brunner Corporation (Canada) Ltd. and that business will require his full time. The Utica factory was founded by George L. Brunner Sr., about 45 years ago and manufactures air compressors, air cooling units and refrigeration. It recently purchased the American Coil Company, Newark, N. J., in an expansion of its air conditioning business and also is constructing a new addition to the Broad St. plant.

Solvay Adopts New Calcium Chloride Bag

THE adoption of a new type, polyethlyene lined paper bag for flake calcium chloride packaging has been announced by the Solvay Sales Division, Allied Chemical and Dye Corp. This new bag will be used for both the 100 and 25 lb. packages. This new package was adopted after extensive field tests and is reported to be stronger, possess a higher resistance to moisture and have a longer storage life than the conventional asphalt lined bag previously used. In addition, the polyethlyene lining is not affected by extremes of temperature; it will not crack in cold weather or melt in hot weather. The new package is expected to be of great advantage to the distributors and consumers of this highly moisture absorbent material.

Mathieson Opens New Philadelphia Warehouse

A NEW Philadelphia warehouse has been opened by Mathieson Chemical Corp. Located in the heart of the transportation district at the junction of Front, Willow and Water Streets, the new facility will serve the greater metropolitan Philadelphia area with door-to-door truck delivery, and will ship to Trenton, Wilmington and Chester. This is the seventeenth in the company's chain of dry ice distribution points stretching from New York to New Orleans. Eric S. Jeltrup is district sales manager and Robert Lyon is the resident representative in Philadelphia for Mathieson's Carbon Dioxide Division.

New Dry-Ice Warehouse

A NEW "Dry-Ice" warehouse and CO_2 cylinder filling plant has been opened in Richmond, Va., by Pure Carbonic Company, A Division of Air Reduction Company, Inc. The warehouse and plant is company-operated and is located at 1702 Belleville Street.

MARTOCELLO ICE PICKS

"Cost You Less To Buy The Best"

Immediate Delivery on Plain Handle Ice Picks

BLADES

of High Carbon Tool Steel, accurately tempered to give you maximum use.

HANDLES

of Sound, Clear Hard Wood with Protective Flexible Lacquer Coating.

FERRULES

of Pressed Steel securely registered on Handle and Plated to Resist Corrosion.

PRICES ON PLAIN AND PRINTED HANDLES HAVE BEEN REDUCED! WRITE TODAY FOR NEW PRICES.

Jos. A. Martocello & Co. 229-231 NORTH 13th STREET PHILADELPHIA 7, PA.

"Serving the Ice Industry Since 1916" There is no Substitute for MARTOCELLO QUALITY"

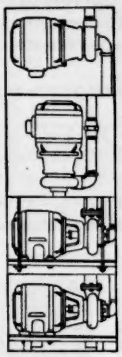
CATALOGS AND BULLETINS

Maintenance of Brine

ICE plant operators and others who use calcium chloride brine will be interested in a leaflet prepared by the Information Service of the Calcium Chloride Association. It covers the fundamentals in using calcium chloride brine and offers suggestions for treating brine in order to protect cans and other equipment. A copy may be obtained from the association, Ring Building, Washington, D. C.

HARD to BEAT for COMPACTNESS • LONG LIFE • BRILLIANT PERFORMANCE

READILY INSTALLED ANY POSITION



Type GMC
AURORA CENTRIFUGAL CLOSE-COUPLED PUMPS

These Close-Coupled Pumps "by Aurora" are ideal for a multitude of applications, particularly where the saving of space is important, or location is unconventional. Operate smoothly in any position. Sturdy bracket insures permanent pump-motor alignment. Ready access to glands — extra deep stuffing box, hydraulically balanced. High quality throughout. Available for screwed or flanged connections. Require small amount of metal for handling corrosives.

APCO TURBINE-TYPE PUMPS Here's the Pump for "1001" duties, SIMPLE — only one moving part, the impeller. Capacities to 150 G.P.M. Heads to 600 ft. Slight change in capacity against drastic head variations.

Write for CONDENSED CATALOG "M" or GMC Bulletin 120

DISTRIBUTORS IN PRINCIPAL CITIES

AURORA Always PUMPS — AURORA PUMP COMPANY

78 Loucks St., AURORA, ILLINOIS

ARMSTRONG PURGERS SAVE 4 WAYS

1. Save Power **3. Save Work**
2. Save Refrigerant **4. Increase Capacity**

CHECK your system for excess head pressure . . . Each 4 lbs. excess raises the load on your compressor, reduces its capacity by 1% and increases power costs 2%! Air and other non-condensables collecting in the condenser and receiver are nearly always the cause. An Armstrong Purger rids the system of air and keeps it that way...reduces loss of refrigerant...saves labor and time. The Purger pays for itself in short order.

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ARMSTRONG MACHINE WORKS
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CEMCO

Double Gig Ice Hoist
Fast - Sturdy - Dependable -

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INCREASE YOUR PROFITS

Happy Says—
YOUR PROFITS JUMP WITH—

"HAPPY" ICEMAN prefers MASTER POINT ICE PICKS

MASTER POINT ICE PICKS
SOLD THRU THE NEW
"TAKE-A-PICK" MASTER POINT PICK VENDOR
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This official organ of the British Refrigerating Industry incorporates the two original British Journals *"Cold Storage & Produce Review"* and *"Ice & Cold Storage"*. Now in its 52nd year. *"M.R."* gives the latest reliable technical and practical information.

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MODEL W-90-M
ADJUSTABLE GRATE— For TRUCK MOUNTING

LITTLE GIANT
ICE BREAKERS

- *SAVE TIME*
- *SAVE LABOR*
- *SAVE ICE*

12 MODELS TO CHOOSE FROM
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NOZZLES • DROP TUBES • CAN DOGS • CAN FILLERS • BLOWERS • BRACKETS • BAGS • HOISTS

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Place your orders for air agitation equipment with us and be assured of receiving precision-machined parts, thus enabling you to make the very best clear raw water ice possible.

We have been serving the ice industry for 15 years and our customers know that although priced conservatively, our equipment can be depended on for satisfactory performance and economic operation.

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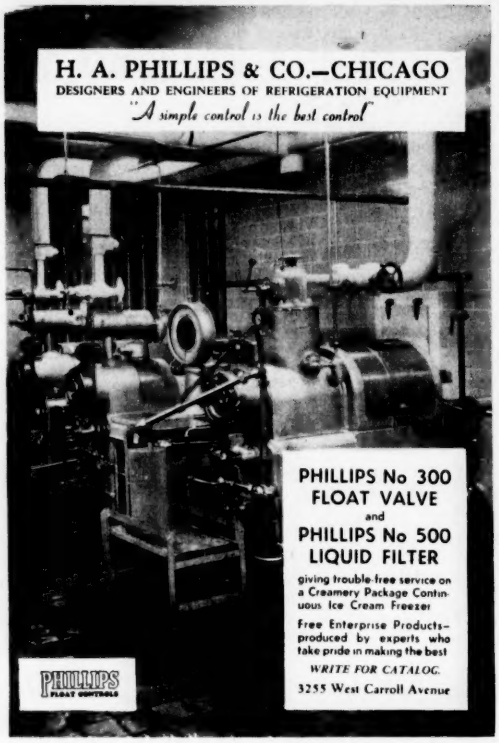
DESIGNERS AND ENGINEERS OF REFRIGERATION EQUIPMENT

"A simple control is the best control"



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giving trouble-free service on a Creamery Package Continuous Ice Cream Freezer

Free Enterprise Products—produced by experts who take pride in making the best

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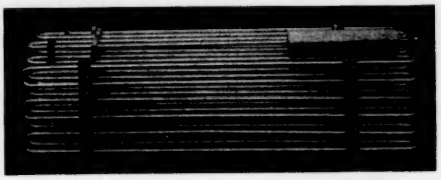

Coils are of selected ammonia pipe—all joints are electrically welded—checked under water with an air pressure of 300 pounds to guarantee tightness.

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★ *Saves Space*

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★ *Saves Cost*

CAN BE USED WITH ANY REFRIGERANT

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Manufactured by

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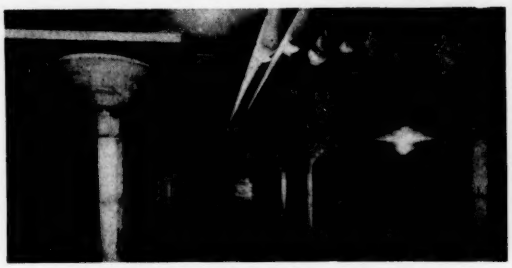

Freezer Storage—70 Ft. x 90 Ft. x 11 Ft. High
One of 4 floors similarly equipped with DIMCO coils.
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High Velocity BRINE AGITATORS

Increase your ice production with properly engineered VERTICAL or HORIZONTAL Brine Agitators. Both cast iron and welded steel agitators are available.

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Sturdy, durable, all-steel construction with dumper support of cast iron. Available in a wide range of sizes... prompt delivery.

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Only the Highest Quality Merchandise and efficient service necessary for the proper and profitable operation of your business. Write for our 1950 catalog.

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Write for details on the NEW Pickwell which vends Ice Picks for 15c.

Full information given on request. For price, add $5.00 to advertised price of the 10c vendor.

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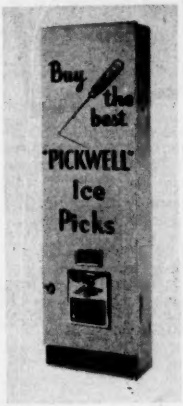

Dimensions: Height: 31"
Width: 9¼"—Depth: 5¼"
Height with Stand: 66"

Shipping weight:
Machine: 24 lbs.
Stand: 24 lbs.

Single lots	$39.50 ea.
2-9 lots	37.00 ea.
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Stands extra	15.00 ea.

All prices f.o.b. our factory

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Convenent Self Service Any Location

Made by the manufacturer of the nationally known BEN SPECIAL Ice Pick. Holds 21 fully assembled Ice Picks equipped with rust preventive, safety straws. Precision engineered for unfailing service. 10c Anti-slug mechanism. Electrically welded steel body for all weather operation. Exclusive quick action non-jamming PATENTED delivery. Weather resistant baked two-tone finish. Chrome plated mechanism. FULLY GUARANTEED. Double lock panel door. Separate lock for coin box.

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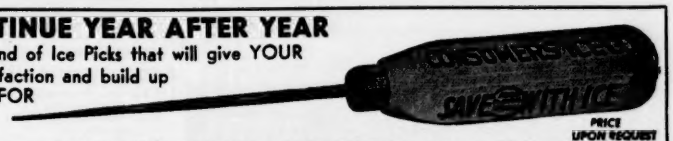
to make the kind of Ice Picks that will give YOUR customers satisfaction and build up GOOD WILL FOR YOU.



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Let the ACME Gas Mask Prove It.

Along with "picture - window" vision and easy breathing, the Acme Gas Mask provides real working comfort. Your chin rests in a pocket molded into the face piece. Thin, flexible rubber gives maximum seal with minimum contact. The face piece seals tight without pulling tight and the comfortable head harness is easy to adjust and stays put.

Greater comfort is another reason why Acme Gas Masks are preferred in the refrigeration industry.

Write for details today.

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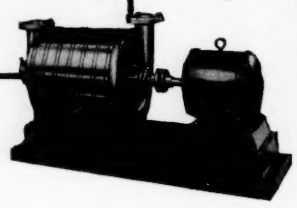
MULTI-STAGE BILLMYRE TYPE BLOWER



Centrifugal type
Single and multi-stage
½ lb. to 7 lbs. pressure
½ hp. to 250 hp.

Since back in the '90's, these trustworthy Blowers and Exhausters have been faithfully serving American industry—for agitation and aeration—for combustion—for cooling and ventilating—for gas and acid production—for conveying—and numerous other applications having various pressure and vacuum requirements.

If you have a problem in handling air or gases of various densities, temperatures or chemical compositions, write today for latest bulletin, B-5, on Lamson Blowers and Exhausters.

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AIR AGITATING SYSTEMS AND FITTINGS
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Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.

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Baker Refrigeration Corp. So. Windham, Maine
Frick Co., Waynesboro, Pa.

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(See Air Compressors)

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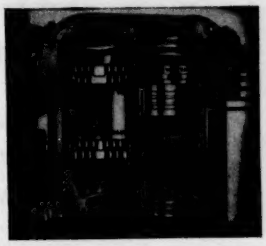

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- Elimination of enforced shutdowns due to faulty compressor valves.
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For Better Performance

We will be glad to submit estimates, if you will send us the name, bore, stroke and speed of your air, gas, or ammonia compressors of any type or size.

VOSS LONG LIFE COMPRESSOR VALVES

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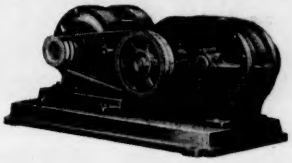

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Today's the day to make sure your blower equipment is ready to deliver the constant, continuous volume of air that's required to meet peak summer demands. If you're planning changes, play safe and install R-C Blowers. Ice plant records prove they'll provide years of continuous delivery at rated capacities.

R-C Blowers are built strong and simple to assure low power cost and negligible maintenance. We suggest prompt action to meet this summer's demand. Tell us your requirements or ask for Bulletin R-C 1247.

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505 Columbia Avenue, Connersville, Indiana

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WEATHERPROOFED ICE SIGNAL CARDS

Coated Both Sides With Paraffine

ANY COLOR

ANY SIZE

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(See Architects and Engineers)

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HAND TRUCKS
Ohio Galvanizing & Mfg. Co., Niles, Ohio

HOISTING APPARATUS
Capital Elevator & Mfg. Co., Columbus, Ohio
Ice Plant Equipment Co., Inc. Philadelphia, Pa.
Reynolds Mfg. Co., Springfield, Mo.

ICE BAGS
Union Bag & Paper Corp., New York, N. Y.

ICE BLOWERS
Gifford-Wood Co., Hudson, N. Y.
Link-Belt Co., Chicago, Ill.

ICE CAN FILLERS
Frick Co., Waynesboro, Pa.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Ice Plant Equipment Co., Inc. Philadelphia, Pa.
Knickerbocker Stamping Co., Parkersburg, W. Va.
Martocello & Co., Jos. A., Philadelphia, Pa.
Ohio Galvanizing & Mfg. Co., Niles, Ohio
Refrigeration Engineering Corp., Philadelphia, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

ICE CANS
Frick Co., Waynesboro, Pa.
Ice Plant Equipment Co., Inc. Philadelphia, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Knickerbocker Stamping Co., Parkersburg, W. Va.
Martocello & Co., Jos. A., Philadelphia, Pa.
Ohio Galvanizing & Mfg. Co., Niles, Ohio
Refrigeration Engineering Corp., Philadelphia, Pa.

ICE CHIPPERS
Capital Elevator & Mfg. Co., Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Index Coupon & Supply Co., La Porte, Ind.
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Co., Minneapolis, Minn.
Refrigeration Engineering Corp., Philadelphia, Pa.
United Ice & Oil Supply, Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE CHUTES
Frick Co., Waynesboro, Pa.
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Jamison Cold Storage Door Co., Hagerstown, Md.
Link-Belt Co., Chicago, Ill.
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.

ICE CONVEYORS
Capital Elevator & Mfg. Co., Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.
The Lilly Co., Memphis, Tenn.
Link-Belt Co., Chicago, Ill.
Refrigeration Engineering Co., Minneapolis, Minn.
United Ice & Oil Supply, Boston, Mass.

ICE CREAM PLANTS
Baker Refrigeration Corp. So. Windham, Maine
Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

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Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
The Lilly Co., Memphis, Tenn.
Link-Belt Co., Chicago, Ill.
Martocello & Co., Jos. A., Philadelphia, Pa.
Micron, Inc., Bettendorf, Iowa
Refrigeration Engineering Corp., Philadelphia, Pa.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE CUBE CONTAINERS
Index Coupon & Supply Co., La Porte, Ind.
The Lilly Co., Memphis, Tenn.
Union Bag & Paper Co., New York, N. Y.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE CUBERS
Flynn and Emrich Co., Baltimore, Md.
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc. Philadelphia, Pa.
The Lilly Co., Memphis, Tenn.
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE CUBING MACHINES
Flynn and Emrich Co., Baltimore, Md.
Gifford-Wood Co., Hudson, N. Y.
The Lilly Co., Memphis, Tenn.
United Ice & Oil Supply Co., Boston, Mass.

ICE DELIVERY BAGS
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Gifford-Wood Co., Hudson, N. Y.
Index Coupon & Supply Co., La Porte, Ind.
The Lilly Co., Memphis, Tenn.
Martocello & Co., Jos. A., Philadelphia, Pa.
Pittsburgh Waterproof Co., Pittsburgh, Pa.
Union Bag & Paper Corp., New York, N. Y.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE ELEVATORS AND CONVEYORS
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Gifford-Wood Co., Hudson, N. Y.
Link-Belt Co., Chicago, Ill.

ICE HARVESTING MACHINERY & TOOLS
Gifford-Wood Co., Hudson, N. Y.
United Ice & Oil Supply Co., Boston, Mass.

ICE MAKING AND REFRIGERATING MACHINERY
Aircraft Production Engineers, Chicago, Ill.
Dorsch, Gesswein & Neuert, Inc. Chicago, Ill.
Enterprise Equipment Corp., Yonkers, N. Y.
Detroit Ice Machine Co., Detroit, Mich.
Frick Company, Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Ice Plant Equipment Co., Inc. Phiadelphia, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.
Reynolds Mfg. Co., Springfield, Mo.
Vogt Machine Co., Henry, Louisville, Ky.

ICE PICKS AND PLANERS
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Index Coupon & Supply Co., La Porte, Ind.
The Lilly Co., Memphis, Tenn.
Martocello & Co., Jos. A., Philadelphia, Pa.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE PICK SCABBARDS
Gifford-Wood Co., Hudson, N. Y.
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Index Coupon & Supply Co., La Porte, Ind.
Martocello & Co., Jos. A., Philadelphia, Pa.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE PICK VENDING MACHINES
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Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
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Vivian Mfg. Co., St. Louis, Mo.

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Halsey Mfg. Co., Inc. Evansville, Ind.
Ice Plant Equipment Co., Inc. Phiadelphia, Pa.
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The Lilly Co., Memphis, Tenn.
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ICE VENDORS
Dickinson & Co., F. B. Des Moines, Ia.
Frick Company, Waynesboro, Pa.
Ice Plant Equipment Co., Inc. Phiadelphia, Pa.
Jamison Cold Storage Door Co., Hagerstown, Md.
Refrigeration Engineering Co., Minneapolis, Minn.
S & S Vending Machine Co., San Jose, Calif.
Thermo Cuber Co., Inc., Chicago, Ill.
Towal Mfg. Co. Inc., Mount Vernon, Ill.
United Ice & Oil Supply Co., Boston, Mass.

INSTANTANEOUS HEATERS
National Pipe Bending Co., New Haven, Conn.

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AUTOMATIC LOADER CRUSHER Saves TIME and LABOR!

Automatic Bateman Loader Crusher makes one-man operation possible . . . saving time and labor. Hopper slide holds five 50-lb. blocks of ice. Operator replaces empty bag while other bag is being filled, and has time to keep hopper loaded.

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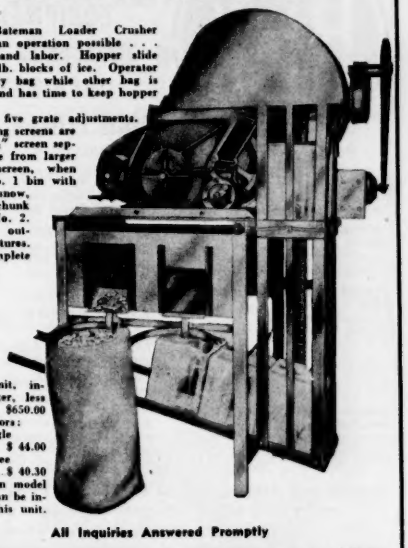

Complete unit, including bagger, less motor $650.00
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¾ H.P. Single Phase ..... $ 44.00
¾ H.P. Three Phase ..... $ 40.30
Any Bateman model 50 crusher can be installed on this unit.

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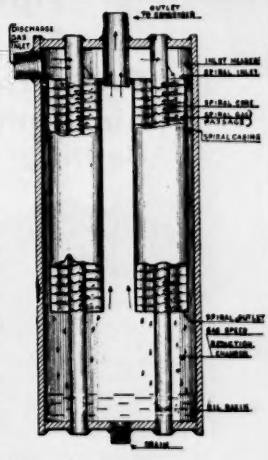

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Removes all non-condensable gases. Holds down head pressure.

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Removes compressor oil and water vapors in the discharge line.

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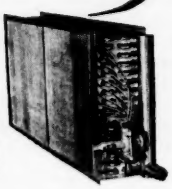

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THE BUYERS

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INSULATING MATERIALS
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Mundet Cork Corp., Brooklyn, N. Y.
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MASKS, AMMONIA
Acme Protection Equipment Co. Chicago, Illinois

MATERIALS HANDLING EQUIPMENT
Ohio Galvanizing & Mfg. Co., Niles, Ohio
The Moto-Truc Co., Cleveland, Ohio

OIL AND LUBRICANTS
Frick Company, Waynesboro, Pa.
Socony-Vacuum Oil Co., Inc., New York, N. Y.
Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.

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Socony-Vacuum Oil Co., Inc., New York, N. Y.
Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.

OIL SEPARATORS
King-Zeero Company, Chicago, Ill.
Rex Engineering & Sales Co. Oklahoma City, Okla.

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Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.

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Vivian Mfg. Co., St. Louis, Mo.
York Corp., York, Pa.

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The Moto-Truc Co., Cleveland, Ohio

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Frick Company, Waynesboro, Pa.
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Philadelphia Pipe Bending Co., Philadelphia, Pa.
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Rempe Company, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.
York Corp., York, Pa.

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(See Coverings, Pipe and Boiler)

PIPE WELDING
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National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Pittsburgh Pipe Coil & Bending Co., Pittsburgh, Pa.
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Byers Co., A. M., Pittsburgh, Pa.
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Rempe Company, Chicago, Ill.
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Mortocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.
Roots-Connersville Blower Corp., Connersville, Ind.

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Mortocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.

PUMPING MACHINERY
Aurora Pump Co., Aurora, Ill.
Deming Co., The, Salem, O.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Layne & Bowler, Inc., Memphis, Tenn.
Refrigeration Engineering Corp., Philadelphia, Pa.
Roots-Connersville Blower Corp., Connersville, Ind.

PUMPING MACHINERY—AIR LIFT
Deming Co., The, Salem, O.
Mortocello & Co., Jos. A., Philadelphia, Pa.
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PUMPS, AMMONIA AND BRINE
Baker Refrigeration Corp., So. Windham, Maine
Deming Co., The, Salem, O.
Frick Company, Waynesboro, Pa.
Roots-Connersville Blower Corp., Connersville, Ind.
Vogt Machine Co., Henry, Louisville, Ky.
York Corp., York, Pa.

PUMPS, DEEP WELL
Aurora Pump Co., Aurora, Ill.
Deming Co., The, Salem, O.
Layne & Bowler, Inc., Memphis, Tenn.

PUMPS, ROTARY
Aurora Pump Company, Aurora, Ill.
Deming Co., The, Salem, O.
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Mortocello & Co., Jos. A., Philadelphia, Pa.
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Frick Company, Waynesboro, Pa.
Rex Engineering & Sales Co. Oklahoma City, Okla.
York Corp., York, Pa.

RAW WATER FREEZING SYSTEMS
Frick Co., Waynesboro, Pa.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Mortocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.
Vogt Machine Co., Henry, Louisville, Ky.
York Corp., York, Pa.

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Frick Company, Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.
York Corp., York, Pa.

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Dickinson & Co., F. B., Des Moines, Ia.
Refrigeration Engineering Co., Minneapolis, Minn.
S & S Vending Machine Co., San Jose, Calif.
Towel Mfg. Co. Inc., Mount Vernon, Ill.

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SCORING MACHINES
Frick Company, Waynesboro, Pa.
Gifford-Wood Co., Hudson, N. Y.
The Lilly Co., Memphis, Tenn.
Perfection Ice Scoring Machine Co., Fort Worth, Texas
United ce & Oil Supply Co., Boston, Mass.

SECOND HAND MACHINERY AND SUPPLIES
Denny & Cark, Chicago, Ill.
Enterprise Equipment Corp., Yonkers, N. Y.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
United Ice & Oil Supply Co., Boston, Mass.

SEPARATORS OIL, STEAM AND AMMONIA
Acme Industries, Inc., Jackson, Mich.
Frick Company, Waynesboro, Pa.
King-Zeero Company, Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Vogt Machine Co., Henry, Louisville, Ky.
York Corp., York, Pa.

SHOULDER PADS
Gifford-Wood Co., Hudson, N. Y.
Index Coupon & Supply Co., La Porte, Ind.
The Lilly Co., Memphis, Tenn.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

SIZED ICE EQUIPMENT
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Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
The Lilly Co., Memphis, Tenn.
Vivian Mfg. Co., St. Louis, Mo.

SPRAY COOLING SYSTEMS
Binks Mfg. Co., Chicago, Ill.

SPRAY NOZZLES
Binks Mfg. Co., Chicago, Ill.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.

SPRAY PONDS
Binks Mfg. Co., Chicago, Ill.
Frick Company, Waynesboro, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.
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National Pipe Bending Co., New Haven, Conn.

STRAINERS
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.

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Frick Company, Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.
York Corp., York, Pa.

TARPAULINS
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Index Coupon & Supply Co., La Porte, Ind.
The Lilly Co., Memphis, Tenn.
United ce & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

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Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.

TIERING MACHINES
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Gifford-Wood Co., Hudson, N. Y.

TRAPS, OIL & STEAM
Armstrong Machine Works, Three Rivers, Mich.

TRUCK BODIES
Gifford-Wood Co., Hudson, N. Y.

TRUCKS, MOTORIZED LIFT
The Mote-Truc Co., Cleveland, Ohio

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Howe Ice Machine Co., Chicago, Ill.
Niagara Blower Co., New York, N.Y.
Refrigeration Engineering, Inc., Los Angeles, Calif.

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Denny & Cark, Chicago, Ill.
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VALVES AND FITTINGS
Aircraft Production Engineers, Chicago, Ill.
Alco Valve Co., St. Louis, Mo.
Frick Company, Waynesboro, Pa.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
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Phillips & Co., H. A., Chicago, Ill.
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Shank Co., Cyrus, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.
York Corp., York, Pa.

VALVES, COMPRESSOR
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WATER COOLERS
Acme Industries, Inc., Jackson, Mich.
Niagara Blower Co., New York, N.Y.

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Layne & Bowler, Inc., Memphis, Tenn.

WATER TREATMENT MATERIALS
Barada & Page, Inc., Kansas City, Mo.
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Industrial Filter & Pump Mfg. Co. Inc., Chicago, Ill.
Mathieson Chemical Corp., Baltimore, Md.

WATERPROOFING MATERIAL
Concrete Materials Corp., Chicago, Ill.

WELDING
Frick Company, Waynesboro, Pa.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Pittsburgh Pipe Coil & Bending Co., Pittsburgh, Pa.
Rempe Company, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

WELL SCREENS
Layne & Bowler, Inc., Memphis, Tenn.

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The biggest water users of the nation agree that Layne Well Water Systems and Layne Vertical Turbine Pumps have more good features than any other make. They are more rugged in construction, heavier in production—and cost less to operate, giving years and years of service for the original installation cost. There is a size for every need, custom built for any depth setting. For catalogs or more information address

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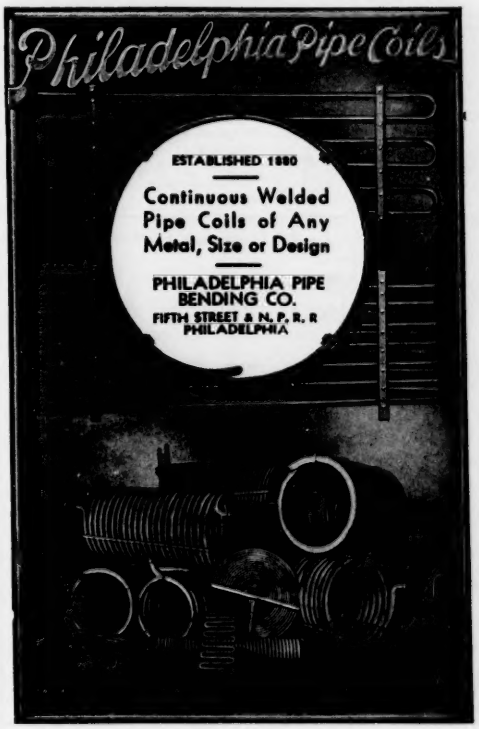
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WANTED and FOR SALE ADVERTISEMENTS

All classified advertisements are payable in advance. Except for Positions and Help Wanted classifications, this section is reserved exclusively for the purchase and sale of USED equipment, existing and used plants, and surplus material.

Rates: $3.50 for 50 words or less; 60c for each additional 10 words or fraction thereof; 75c per line for bold face headings; $9.00 per inch for ads all set in bold face type or listing items on separate lines.

ICE PLANTS—*Wanted and For Sale*

FOR SALE—Two 30 ton York installation complete ice plants, at a sacrifice. Must be removed from present location. For further information write or wire Box MY-6, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

FOR SALE—ONE HORIZONTAL MOTOR DRIVEN 20 TON VILTER PLANT

238—400 lb. cans, 11½" x 22½" x 57". Entire plant installed new in 1921. S. L. Young & Sons, 405 N. Franklin, Austin, Minnesota.

FOR SALE—224 can York ice plant, electric with double hoist and filler, six trucks, large storage, scoring machine and sizer. Shoe repair shop to get you through the winter. Property located on very valuable lot. Property and equipment appraised at $64,865.00; will take $55,000.00 cash. Inspection invited. Steel Ice Co., Jackson, Mississippi.

USED MACHINERY—*Wanted and For Sale*

FOR SALE—1 Vilter compressor 9½x9½ with 60 h.p. synchronous motor, 440 volts. Electric Ice Co., Inc Prichard, Alabama.

FOR SALE—York 8x8 ammonia compressor with fly wheel, serial No. 16312, speed 165 r.p.m. Located in Indianola, Mississippi. Leland Ice & Cold Storage Company, Leland, Miss.

FOR SALE — 90—1½" T's with flanges; 100—2" T's without flanges; 35—3" T's without flanges. New; never been used. All 20% off. Mojonnier Bros., 4601 W. Ohio St., Chicago 44, Ill.

FOR SALE — ONE No. 3 VICTOR ICE BREAKER

5 h.p., 3 phase, 220 volt motor, clean, in good operating condition. Reasonable. Contact North American Creameries, Inc., 320 Metropolitan Life Bldg., Minneapolis 1, Minn.

FOR SALE—Three 100 lb. and one 50 lb. Thermo Cubers and one 50 lb. Rheinhold saw cuber. All units in excellent condition. Any reasonable offer will be considered. Acme Ice Company, 3604 W. 59th St., Chicago 29, Ill.

FOR SALE—Three ice tanks with coils and agitators, each 20 cans wide and 16 cans long. Two can dumping equipment for two of these tanks. Excellent condition and very cheap. New Ice Co., 1634 Midland Blvd., Fort Smith, Arkansas.

FOR SALE—24"x14'-0" 4-pass horizontal condenser; 20 ton single pass shell & tube brine cooler; 1000 lb. electric hoist; single can York ice chute; 11½ x 22½x44/45 new cans; 3 x 3 single and 5 x 5 twin cylinder York self-contained units; Roots Connersville blowers; Water and brine pumps; motors, valves, fittings. Owen Equipment Co., Bristol, Virginia.

FOR SALE—4 vertical shell & tube ammonia condensers, each 42" dia. x 14' No. 10 gauge charcoal iron tubes—with 4" gas, 1½" liquid, and 1" equalizer outlets—½" purge valve and ½" pop valve—500 lb. pressure—1260 sq. ft. Were in regular use until recently replaced by evaporative condensers. Address Box MY-12, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

FOR SALE—ICE PLANTS & EQUIPMENT

30- 40- 50-Ton Ice Plants
1—10"x10" York ammonia compressor direct connected to a 60 H.P. synchronous motor 200 R.P.M.
1—10"x10" York ammonia compressor direct connected to 100 H.P. synchronous motor 200 R.P.M.
1—9"x9" York ammonia compressor direct connected to 50 H.P. synchronous motor 200 R.P.M.
1—10"x10" York ammonia compressor 200 R.P.M.
2—9"x9" York ammonia compressors 200 R.P.M.
1—Duplex 10"x10" Carbondale High Speed Compressor direct connected to 250 H.P. synchronous motor.
2—6½"x6½" York ammonia compressors high speed with or without motors.
1—6"x6" Voss ammonia compressor.
2—4"x4" York H.S. Self Contained units.
1—3"x3" Frick H.S. Self Contained units.
Shell and tube vertical condenser 36"x14"—162—2" tubes.
2—16" dia. x 10'0 long 6 pass enclosed type ammonia condenser.
1—25 dia. x 10'0 long 5 pass enclosed type ammonia condenser.
Assorted sizes electric hoists ranging from 2 to 6 ton capacity.
1—Gifford Wood Uline Scoring Machine Series No. 3.
1—Gifford Wood four tier, ice tiering machine.
2—Shell and tube submerged type brine coolers—36"x12"x143"—2" tubes.
3—Gifford & Wood Creasey Ice Crushers, motor driven.
1000—11"x22"x48" Ice cans, good condition.
Brine coolers, double pipe 2" and 2" horizontal brine coolers, submerged.
Shell and tube type, 1¼" and 2" ammonia coils approximately 10,000 feet.
Send us your requirements on any equipment you may need.

Enterprise Equipment Corporation **Phone: Yonkers 8-8118-9**
77-79 Alexander St., Yonkers, N. Y.

USED MACHINERY—*Wanted and For Sale—Cont.*

FOR SALE—York 20 ton 4 can grid system low side complete except coil and agitator. Tank contains 240 cans 11"x22"x51". This unit has complete harvesting and air equipment. Also available one J-22 International water softener and a number of storage room doors. Contact Wayne Ice Co., Box 823, Goldsboro, N. Car.

REFRIGERATORS FOR SALE

We have 500 used Ice Refrigerators in excellent condition for sale. 100 lb. Capacity, 5 cu. ft. top-icers at $25.00 each (not reconditioned) and $35.00 each (reconditioned), F. O. B. our plant, uncrated.

C. HOFFBERGER COMPANY
1517 N. Gay St. Baltimore 13, Maryland

FOR SALE—One 6¾"x5" V/W York ammonia booster compressor 8 cylinder V-belt drive complete with base, including 440 volt A.C. motor and 36"x12' long D.E. gas and liquor cooler plus valves. This equipment is new and has never been installed. If interested contact W. A. Moore, General Manager, New Orleans Cold Storage & Warehouse Co. Ltd., 305 Gaiennie St., New Orleans, La.

FOR SALE—2 Arctic 9x9 with motors, York 9x9, York 5x5 self-contained unit, Baker 4½x5 self-contained unit, Frick 6x6; small compressor units; 288 Arctic Pownall ice cans; 40 ton shell and tube ammonia condenser, 12" x 10' ammonia receiver; 36" x 10' shell and tube brine cooler; 5 h.p. vertical agitator; 3 h.p. Hoffman blower, coils, fittings. 1 each, 150 and 180 h.p. Fairbanks-Morse Diesel engines. Belted type generators, motors, oil storage tanks. Parke Pettegrew & Son Co., 370 W. Broad St., Columbus 8, Ohio.

FOR SALE—Modern 34 ton raw water ice plant located in a good farming community in Arkansas. Plant sells capacity in season. We sold over 100 ice refrigerators in 1949 and season just beginning, and have a good demand for ice refrigerators now. Partnership must be dissolved. Either one or two houses available. Plant will pay for itself in three years. Address Box MY-4, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

FOR SALE—Two 3x3 twin Fricks, one 4x4 York, self-contained. 3x3, 4x4, 5x5, 6x6h 7½x7½, 8x8 and 9x9 York compressors, splash lubrication. One 20 ton and one 40 ton Vogt horizontal shell & tube condensers, one 2 h.p. vertical agitator. One 15 ton horizontal enclosed shell & tube brine cooler. Write E. Niebling, 1546 St. Clair Ave., Mt. Healthy, Cincinnati 31, Ohio.

FOR SALE—Two cylinder York 10x10 ammonia compressor ex. hy. ammonia fittings and valves as follows: ½" to 2½" screw elbows—45° elbows—tees—couplings—bushings. ¾" to 1½" valves—flanged elbows—tees—unions. ½" to 2½" double flanged elbows. Write for complete list. Pioneer Valley Refrigerated Warehouse, Inc., P.O. Box 155, Brightwood Station, Springfield, Mass.

FOR SALE

Complete used ice making systems, ammonia compressors, shell & tube and double pipe condensers, brine coolers, oil traps, receivers, ice cans, electric cranes, pumps, valves and fittings. Send us your requirements.

B & E REFRIGERATING CO.
2 Orange St., Newark, N. J. Phone Mitchell 3-7790-91

FOR SALE—BARGAINS—300 KW, 300 RPM, Fairbanks-Morse Diesel Electric 2400/460 v., 3 ph. 60 cy., power unit, fine condition, incl. air starting, switchboard, circulating pump, cooling tower, silencer, wiring; one 73 KW Fairbanks-Morse similar unit.

BENJAMIN W. BISSELL, Owner's Engineer
521 K of P Building, Indianapolis, Ind.

MODERN DIESEL GENERATING PLANTS

300 HP used Fairbanks-Morse Diesel engine, model 32-E-14, four cylinder, serial #795310, 14" x 17", 300 RPM, Woodward governor, starting equipment, circulating pump, lubricating system, filter, closed type cooling system, exhaust stack and silencer; engine direct connected to Fairbanks-Morse generator type T.G.Z.O., 200 KW, .8 PF., 3 phase, 60 cycle, 240 volt (can be reconnected to 440 volt). Belted exciter, switch gear, wiring and piping.

300 HP used Buckeye Diesel engine, model "E", eight cylinder, vertical, cylinder sizes 9½" x 14", 400 RPM, with starting equipment, circulating pumps, automatic lubrication system, oil filter, cooling system, direct connected to General Electric generator type "ATT", 200 KW, 480 volt, 3 phase, 60 cycle, .8 PF., complete switch gear and exciter. Can be operated for inspection.

Priced To Sell

DENNY & CLARK **1923 W. North Ave. Chicago 22, Illinois**

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All Used Equipment Is Reconditioned in Our Modern Machine Shop

THIS IS ONLY A PARTIAL LIST—WRITE ABOUT ANY REQUIREMENTS WHICH YOU HAVE WE ARE BUYING ADDITIONAL EQUIPMENT ALL OF THE TIME.

Compressors With or Without Motors

Item No.

1—4x4 York, 300 RPM 16
6—6x6 York's, 200 RPM 20
1—6x6 Frick, 257 RPM 21
2—6½x6½ Arctics, 350 RPM, forced feed lub 30
1—7¼x7¼ Baker, 350 RPM, forced feed lubrication 35
1—7x7 Frick, 200 RPM 40
1—7½x7½ York, 200 RPM 51
2—9x9 Arctic, 300 RPM, forced feed lub 62
1—9x9 Frick 225 RPM direct connected to a 60 HP synchronous motor, forced feed lubrication 67
2—9x9 Late type Yorks, 400 RPM, forced feed lub 69
1—9x9 Frick, 200 RPM 70
1—9x9 York, 200 RPM 71
1—9x9 Worthington, 325 RPM, forced feed lub 72
1—10x10 De La Vergne, 360 RPM, forced feed lub 73
1—10x10 York, 257 RPM, forced feed lub 80
1—10x10 Carbondale, 100 HP synch. motor, 350 RPM 81
3—10x10 York's, 225 RPM, semi-forced feed lub 82
1—12x12 Frick, Forced feed, 300 RPM 89
1—11x13 York, 164 RPM, forced feed lub 90
1—17x18 Frick, direct conn. 300 HP synch. motor 91

Diesel Driven and Diesel Engines

1—8x8 York—Direct connected to 50 H.P. Fairbanks-Morse at 257 R.P.M. 210
1—175 H.P. Fairbanks-Morse Diesel engine 211
1—150 H.P. Van Severin—300 R.P.M.—Diesel engine 212

Steam Driven

1—7½x7½ Vertical York, 200 R.P.M. direct connected to steam engine 326
1—8x8 Vertical York, 300 R.P.M. direct connected 327

Complete Ice Plants

Item No.

1—15-ton electric driven plant 630
1—600 Can Trunk Coil Type—York Plant, Brand New Tank. *Complete with 10 Can Grids. This plant is equal to new* 631
Brand New 8 to 10-ton Clear Ice-Making Plants—110 Cans—Electric or Diesel Drive—2 Can Pull 632
1—*247 Can, 22-ton ice plants, like new* 632A
1—35-38 ton New Clear Ice Making Plants 635

Self-Contained Units

3—4x4 York & Fricks 742
1—5x5 York—390 R.P.M. 743
1—4½x5 Lipman—360 R.P.M. 744
1—3x3 Worthington 748
1—5x5 Frick—Forced Feed—400 R.P.M. Latest Type 758

Brine Coolers

1—34x12—96—2—Retubed 801
1—34x10—100—2 802
1—48"x16'—130--2" tubes 808

Condensers

3—100 ton shell and tube condensers retubed 919
2—Stands—Vogt Multi-tube—Each stand 6 pipes high. Each pipe 9"x18" with 7—2" tubes 920
1—125-ton, Vertical Shell & Tube, 196 2" tubes 921
1—120 ton, 216—2" retubed Vertical Shell & Tube 922
2—20 ton Horizontal—retubed 924

Ice Cans

150—11½"x22½"x44"—cap refinished in zinc
500—11"x22"x47"—ice cans

Pipe

10,000 feet wrought Iron pipe—2"—like new 451

NEW EQUIPMENT FOR IMMEDIATE DELIVERY

Compressors With or Without Motors

Item No.

3x3 to 5 x 5—390 R.P.M. 1001
6x6 to 10x10—390 R.P.M. 1002
3x3 to 5 x 5—Self-contained units, complete 1003
5x5—Self contained—15 H.P. motor—V Belt 1004

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4—12¾x12 Horizontal—36—1¼" tubes 1020
2—30x14 Vertical 109—2" tubes 1021
1—16"x10"x10' Shell and Tube Condenser, 60 1¼" tubes 1022

Ice Cans

50—100 lb. cans—15½"x8"x31" 1041
40—50 lb. cans—6"x12"x26" 1042

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½" to 2"—Screwed Globe Valves 1051

Item No.

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Relief Valves 1054
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Extra heavy Ammonia Nipples 1057

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All Sizes.

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New 2 H.P. and 3 H.P. Vertical Agitators

Receivers and Oil Separators

All sizes 1080

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Last year in Minneapolis, Chicago and St. Louis winter experiments showed that greater volume was obtained by keeping normal off season truck deliveries and letting Sturdy-Built Stations capture the plus market. By letting Sturdy-Built Stations carry the off season load, profits were substantially increased.

S & S equipped stations sell ice 24 hours a day, serving occasional customers who account for 27% of all ice sold through Sturdy-Built Stations as well as the *"after hour"* customers. (45% of all ice sold from Sturdy-Built Stations is purchased between 4:00 P.M. and 8:00 P.M.).

You can depend on Sturdy-Built to increase volume, lower distribution costs and stretch profits. The dependability of S & S Ice Vending Machines and Sturdy-Built Stations for 18 years remains unequaled and unchallenged.

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IN THE EAST
F. B. DICKINSON CO.
Highland Park Station
Des Moines, Iowa

REFRIGERATED STURDY-BUILT ICE VENDING STATIONS

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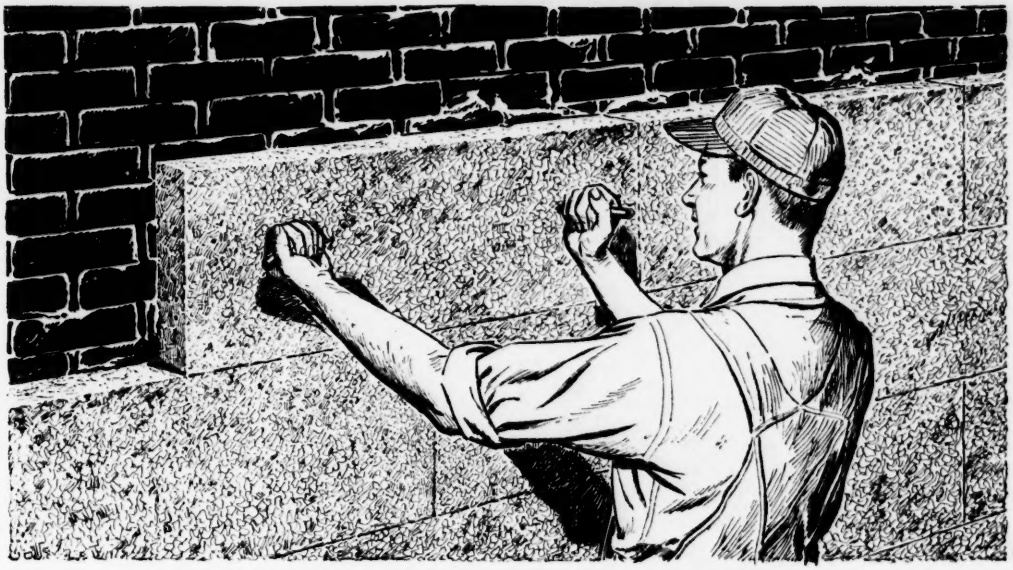
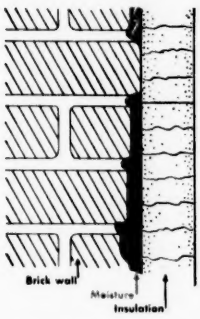


What's wrong with this picture?

This picture shows one of the most serious mistakes that can be made in cold room construction. Back plaster has been omitted, and the insulation is being erected directly against a primed brick wall.

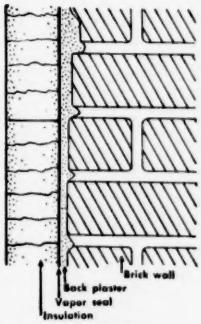


WRONG

When you leave out back plaster, insulation adheres only to the high spots of the irregular wall surface. The bond will be weak. Even more serious, moisture coming through the wall will collect in the hollows behind the insulation. Then it will work its way into the insulation material, and heat will pour through because moisture is a heat conductor. If that moisture freezes, the insulation will bulge from the wall.

These dangers can be avoided by making the wall true and even with back plaster. It fills all voids and hollows, provides a smooth surface for a tight insulation bond, and cuts down air flow. Add a good vapor seal of asphalt paint and hot asphalt and a truly moisture-resistant material, such as Armstrong's Corkboard, and the job will last years longer.

Portland cement back plaster is just one of the things Armstrong engineers recommend to keep moisture out of low-temperature insulation. In almost 50 years in the insulation business, the entire Armstrong organization has learned the answers to the moisture problem. The next time you have an insulation job, take advantage of this knowledge. Call the Armstrong office nearest you or write to Armstrong Cork Company, 4505 Concord St., Lancaster, Penna.



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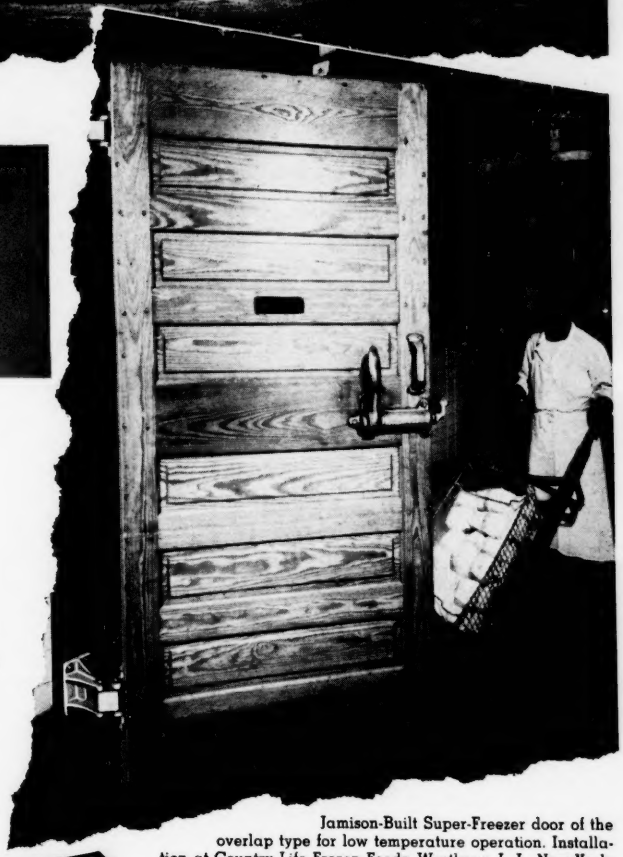
MATERIALS - INSTALLATION

FOR ALL TEMPERATURES FROM 300° F. BELOW ZERO TO 2800° F.

In thousands of frozen food plants throughout the country the summer's crops pass through Jamison doors to await use next winter.

The frequent operation and heavy use given to these doors call for the rugged hardware and tight sealing action of Jamison-built doors. Standard doors are available for all ordinary temperature ranges and door openings—also, for such applications as can and crate passing, keg passing, ice cream can passing, ice chutes.

For detailed information on Jamison Cold Storage Doors request Catalog 175.



Jamison-Built Super-Freezer door of the overlap type for low temperature operation. Installation at Country Life Frozen Foods, Westbury, L. I., New York.

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